simPlugins EFIS Panel Builder

User Manual

BajuSoftware, LLC

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Introduction

Panel Builder is an add-on Avionics Package that allows the creation of custom Instrument Panels to interface with several Flight Simulator Programs.

Typically instrument panels are displayed on a separate monitor in full-screen mode. A mask can be used to cover unused portions of the monitor to more closely resemble a typical instrument panel

Panel Builder can be run on the same computer as the flight simulator software. It is recommended thought to utilize one or more additional computers for this purpose for performance reasons.

Each instrument is ‘free floating’ in the screen. It can be resized, moved around the screen and combined into a predefined panel. For the latter purpose, a management tool called Panel Builder is provided. Panel Builder allows the building of instrument panels for different aircraft types and provides a mechanism for starting and stopping all instruments.

Some instruments contain configuration options that are accessible via a right click menu option. This is used for setting ranges and/or color bars on the instrument, calculations and performance related options. This allows using the same instrument for a slow piston powered airplane or a high performance turbine powered airplane.

The same instrument can be used multiple times in a panel. This allows for example to build panels for multi-engine aircraft or for defining a pilot and co-pilot instrument panel.

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Capabilities and Features

Multiple Flight Simulators supported.	Currently supported are X-Plane (V9.0 and above), MS Flight Simulator X (Acceleration) and MS Flight Simulator 2004 Interface software is supplied depending on version purchased. The same Panel can be used with all supported Flight Simulators.
Modular Design	Instruments (Panel Builder) and Interface software are separate modules. This enables adding new interfaces for other flight simulators without changing the instrument software. The interface software is always installed in the same computer as the flight simulator. The instruments (Panel Builder) can be installed on separate, networked computers.
Vector based Instruments	Allows the sizing of instrument to match a cut-out mask or to set them to the required size for easy reading. No images are used to draw instruments on the screen. Instruments are always crisp and easy to read in any size.
Network support	Panel Builder is typically installed on one or more additional, networked computers. This will lower the performance impact the external panel has on the flight simulation software. It also provides additional screen real estate for the panels.
Interface Configuration	Each Flight Simulator Interface can be fully configured to allow for customization and enabling the support of new flight simulator features in the future.
Fixed Wing, Helicopter and Soaring Instruments	All of the most common fixed-wing aircraft and helicopter instruments are provided (over 100). Additional instruments can be added as they become available.

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‘Free-floating’ Instruments	All instruments provided can be moved anywhere on a monitor. This allows accurate placement of instruments on a predefined back-ground graphic or cut-out mask. They can be locked in place to avoid accidental moving.
‘Free-sizing’ Instruments	All instruments can be resized in fine increments. This is useful to fit instruments into a panel mask
Configurable Instrument Ranges	Instruments can be configured to match the aircraft’s performance data. This configuration allows the use of all instruments in different aircraft types. The configuration is stored within an instrument for a specific panel.
Multiple-use Instruments	Each instrument can be used multiple times within the same panel. This allows the use of engine instruments for multi-engine aircraft and to design a pilot and co-pilot panel.
Commercial Applications	The **Commercial version** licenses the user to deploy Panel Builder in a commercial environment and for resale as part of a complete flight simulator environment. Each deployment does require the purchase of a separate license.

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Technical Requirements

Hardware	Processor	Any Dual Core Processor or greater
	Memory	4GB (32 Bit), 8GB (64 Bit)
	Disk Space	1 GB (approx.)
Operating Software	Windows Vista	32 or 64 Bit
	Windows 7	32 or 64 Bit
	Windows 8	32 or 64 Bit
	Windows 10	32 or 64 Bit
Flight Simulator	X-Plane	Version 9 and Version 10 (32&64bit)
	MS Flight Simulator X	Acceleration or SP2
	MS Flight Simulator 2004	Any version
	Lockheed Martin Prepar3D	Version 1.2 or greater

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Licensing

Panel Builder comes in three versions, Home Version, Academic and Commercial Version. The Home Version is intended for home use only, which means that you can use Panel Builder on your home network only. The Commercial Version is intended for commercial applications. The Commercial Version is typically used for integration into commercial Flight Simulators, Flight Training, to be shown at Exhibitions and Shows and other commercial applications. In general, any use that is outside of the home requires a Commercial License. The Academic Version is like the Commercial Version but is limited to educational Institutions like colleges.

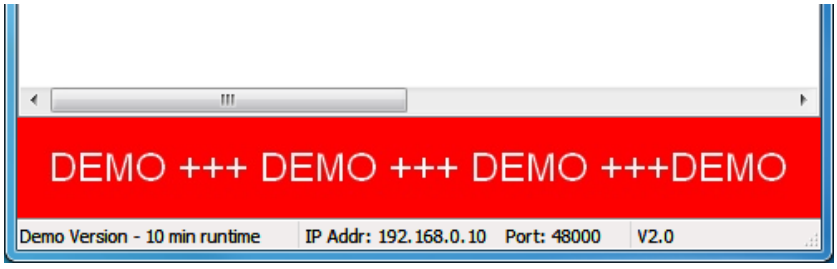
All versions are distributed using the same Installation Package and each version is enabled by a different activation scheme.

All versions are delivered on an USB Memory stick and the memory stick has to stay plugged in on the computer where Panel Builder is installed on. Replacement USB sticks can be ordered.

The Home Version has also an alternate licensing scheme via an Activation Code. This licensing is used when you purchase a download version of Panel Builder. Licensing is activated by requesting an activation code via E-Mail. A serial number has to be sent and an activation code is returned. Panel Builder provides a facility to enter this activation code. See next chapter for more information.

If Panel Builder is started and neither a USB stick nor Activation code is present, the software reverts to Demo Mode. Demo Mode has the following restrictions:

- No new panel can be built
- Only 6 instruments can be added to the existing panel
- The runtime is limited to 10 Minutes.
- Demo Mode is clearly indicated on the Panel Builder Main Screen



To return to a licensed mode, either a valid USB Memory stick has to be plugged in, or an activation code has to be entered. Panel Builder needs to be restarted in both cases.

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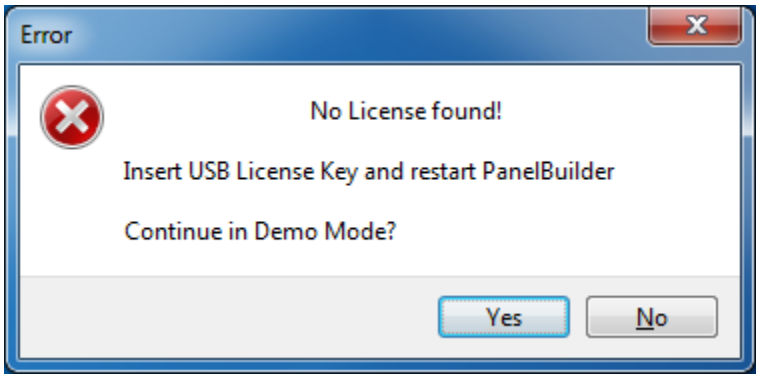
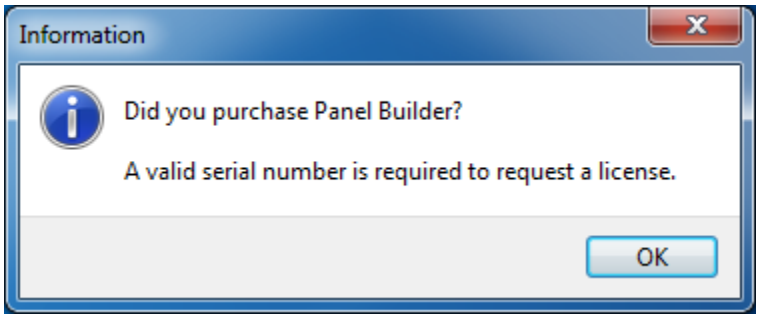
Licensing for HOME Download Version

When Panel Builder starts the first time after installation, the license is checked. The following message appears if no license is found:



Click on the [Yes] button. Then select Configuration and Enter Activation Code from the menu. The following information is displayed:



Activation requires a serial number that you should have received from your reseller. If you do not have received this serial number, contact your reseller. Click on [OK].

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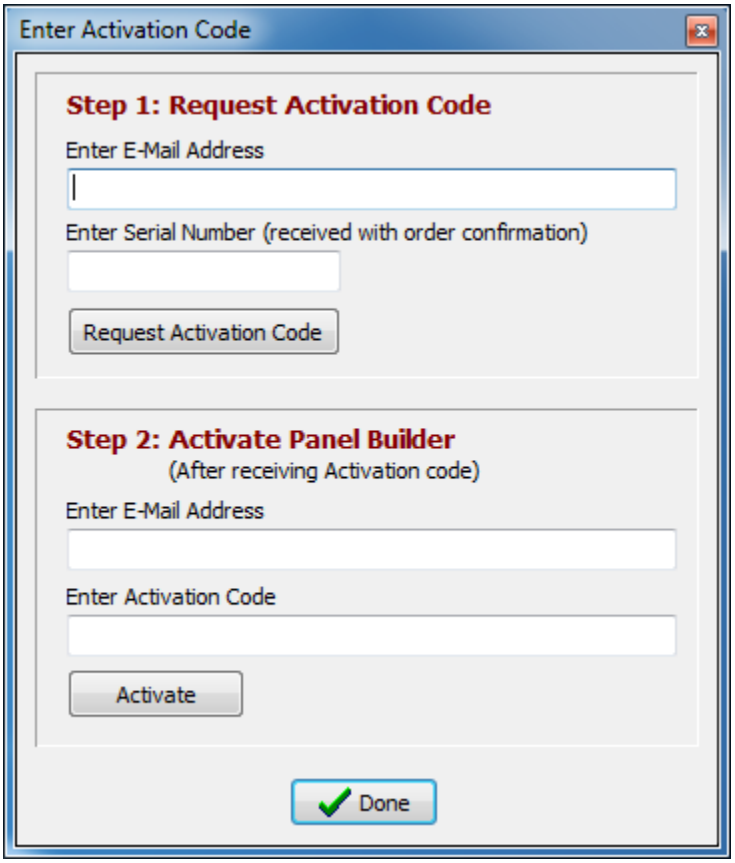

Licensing is a 2 step process. First you request an activation code, and then you enter the received code.

Requesting an activation code is done automatically if connected to the Internet or manually via E-Mail. The activation code is returned to you via E-Mail.

Each Activation Code is unique and is registered to the Serial Number, your E-Mail Address and the Computer you have Panel Builder Installed on. The Activation allows for unlimited re-installs on the same computer. If you have a new computer and install Panel Builder, use the same activation code you have received. There are limited numbers of reactivations for new computers. Once you reach the limit, you will receive an e-mail explaining what to do in this case.

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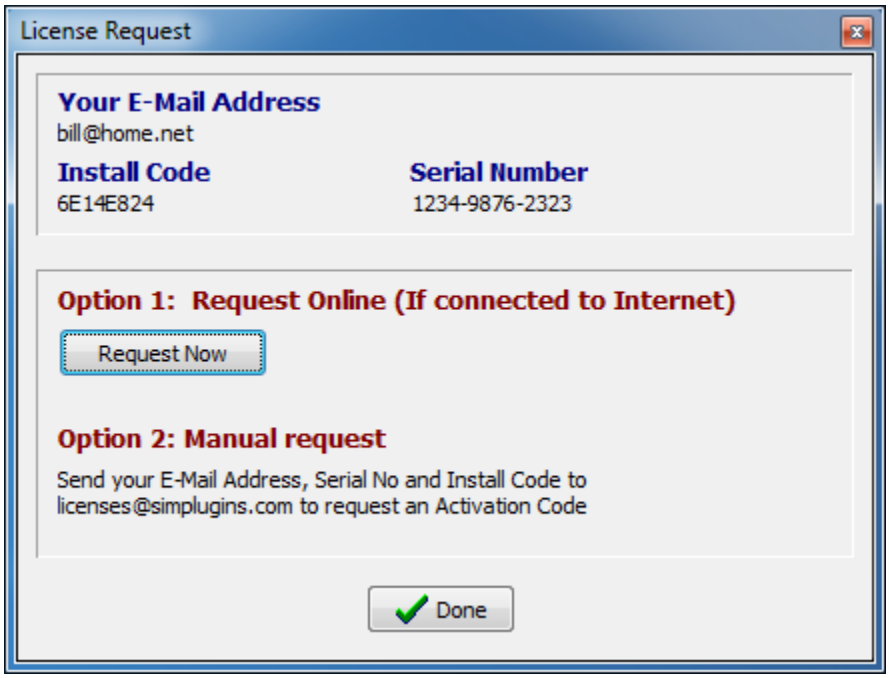
Step 1 – Requesting an Activation Code

Enter your E-Mail Address and Serial Number then click on [Request Activation Code].

The following message appears. You have 2 options, either click on [Request Now]. This will send the request directly. Or if you are not connected to the Internet, make a note of your E-Mail Address, the Install Code and the Serial Number as displayed and send an e-mail to the e-mail address shown on the form.

Click on [Done] and [Done] again. You can use Panel Builder in Demo mode until you receive the activation code.



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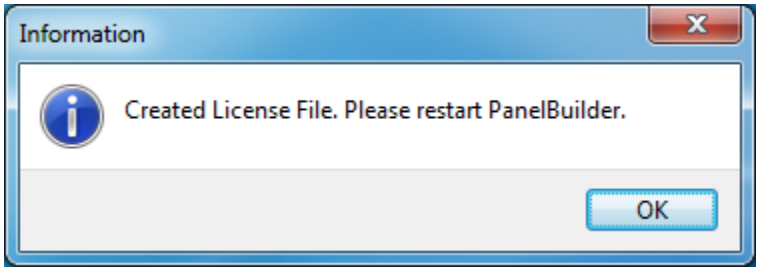
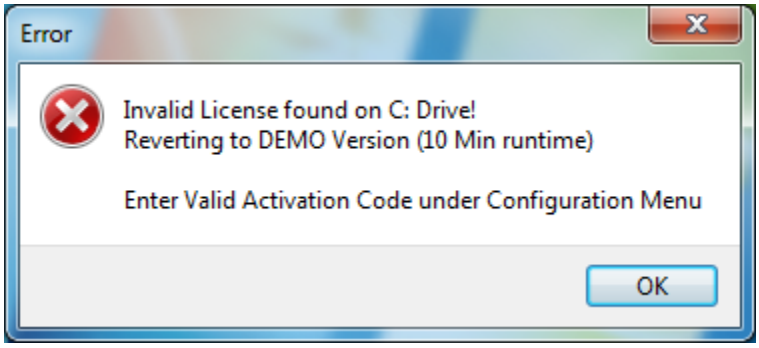
Step 2 – Entering the Activation Code

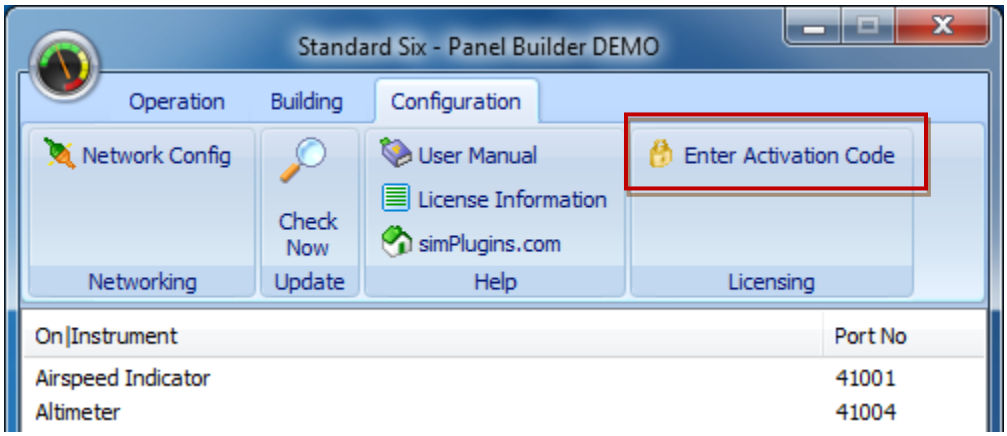
Once you receive your Activation Code via e-mail, start Panel Builder and click [Yes] on the License check screen. This time enter the received Activation Code under Step 2 and click the Activate Button. You will receive a message that the license has been generated.



If you made a mistake entering the code, the next time Panel Builder starts, you might get the following message:


Error
Invalid License found on C: Drive!
Reverting to DEMO Version (10 Min runtime)
Enter Valid Activation Code under Configuration Menu
OK

Click in the [OK] Button and re-enter the code in the Configuration Menu under 'Enter Activation Code'



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Integration Scenarios

This section describes different scenarios Panel Builder can be used with. Each scenario requires different installation procedures and network configuration.

There are three distinct scenarios. The number of monitors attached on a computer does not affect any installation or configuration options if the multiple monitors are configured to expand the desktop area (virtual desktop across multiple monitors).

Single Computer – Single or multiple Monitors

Diagram

Computer 1 - Flight Simulator & Instruments

Module Selection

Computer	Flight Simulator Installed	Panel Builder Modules Required
Computer 1	X-Plane	X-Plane Interface Panel Builder
	Microsoft Flight Simulator X	MS Flight Simulator X Interface Panel Builder
	Microsoft Flight Simulator 2004 (or older)	FSUIPC Interface Panel Builder
	Lockheed Martin Prepar3D	Prepar3D Interface Panel Builder

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Two computers - Single or multiple monitors

Diagram

Computer 1 - Flight Simulator

Computer 2 - Instruments

Module Selection

Computer	Flight Simulator Installed	Panel Builder Modules Required
Computer 1	X-Plane	X-Plane Interface
	Microsoft Flight Simulator X	MS Flight Simulator X Interface
	Microsoft Flight Simulator 2004	FSUIPC Interface
	Lockheed Martin Prepar3D	Prepar3D Interface
Computer 2	-	Panel Builder

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Multiple computers - Single or multiple monitors

Diagram

Computer 1 - Flight Simulator

Computer 2 - Instruments Pilot

Computer 3 - Instruments Co-Pilot

Module Selection

Computer	Flight Simulator Installed	Panel Builder Modules Required
Computer 1	X-Plane	X-Plane Interface
	Microsoft Flight Simulator X	MS Flight Simulator X Interface
	Microsoft Flight Simulator 2004	FSUIPC Interface
	Lockheed Martin Prepar3D	Prepar3D Interface
Computer 2	-	Panel Builder
Computer 3	-	Panel Builder

Note: Running Panel Builder on multiple computers requires a license for each computer you are running Panel Builder on.

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Installation Procedures

Panel Builder is installed using a 3 step process. The installer software is installed first which allows the selection of the different modules to be installed on each computer (or on a single computer). The different modules are:

- Panel Builder
- X-Plane Interface (X-Plane 9 and 10.1)
- X-Plane Interface (X-Plane 10.2 or greater)
- FSX Interface
- FSUIPC Interface

Depending on the Flight Simulator you are using, choose the appropriate interface module in Step 2.

Step 1

Install the Panel Builder Install package on each computer that will be part of the overall Flight Simulator System.

If you are installing from the supplied license USB Key, you can run the installer directly on the USB Key and can skip this step. Locate the USB key in Windows Explorer and double-click on *PanelBuilderInstaller*

Step 2

Run the Panel Builder Installer on each computer and choose which modules should be installed on each computer. The selection of modules is dependent on the integration scenario applicable to your simulator system as described in the previous chapter.

Step 3 (Optional)

Configure each module of Panel Builder for:

- Networking
- Performance

This step is optional. All modules have been preconfigured (even the networking!) and no changes are necessary.

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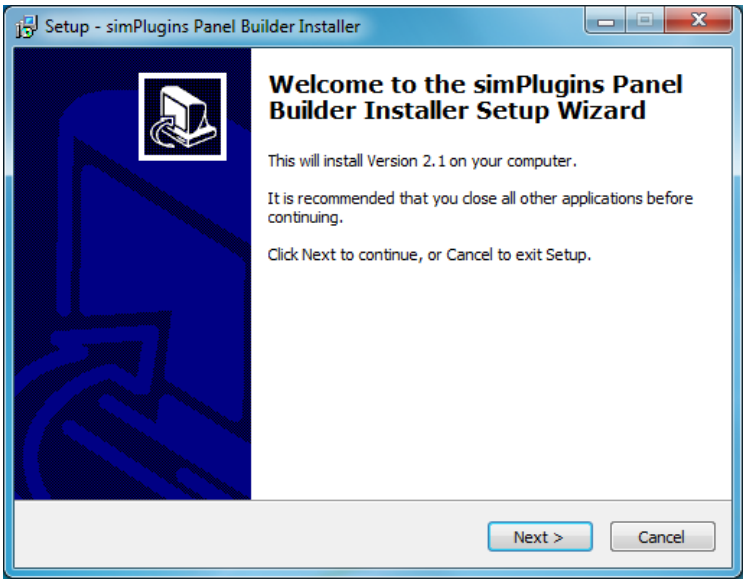
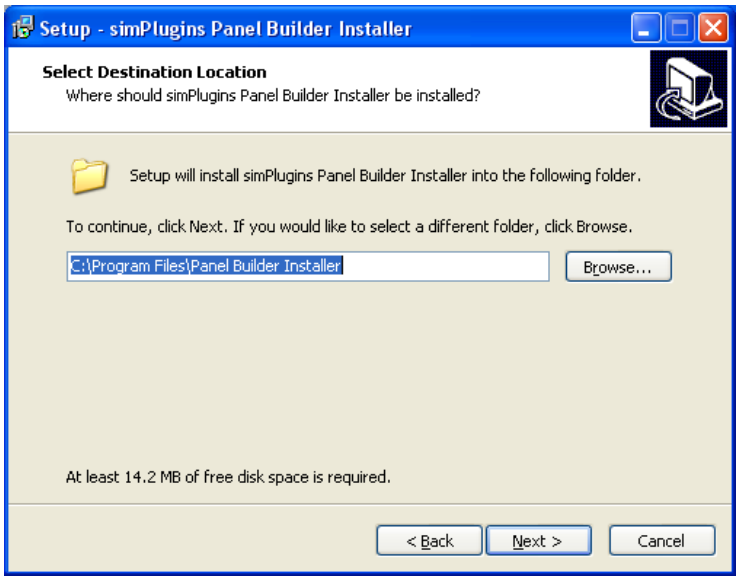
Step 1 – Install Panel Builder Installer

Skip this step if you run the installer from the supplied USB Key

Copy the installation package to each computer that is part of your flight simulation system. Start the installation program on each computer by locating the installation program and double click it. This will launch the installation.


Setup - simPlugins Panel Builder Installer
Welcome to the simPlugins Panel Builder Installer Setup Wizard
This will install Version 2.1 on your computer.
It is recommended that you close all other applications before continuing.
Click Next to continue, or Cancel to exit Setup.
Next >
Cancel

Click the [Next >] button.


Setup - simPlugins Panel Builder Installer
Select Destination Location
Where should simPlugins Panel Builder Installer be installed?
Setup will install simPlugins Panel Builder Installer into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C:\Program Files\Panel Builder Installer
Browse...
At least 14.2 MB of free disk space is required.
< Back
Next >
Cancel

This specifies where the install packages will be installed to. Click [Next >].

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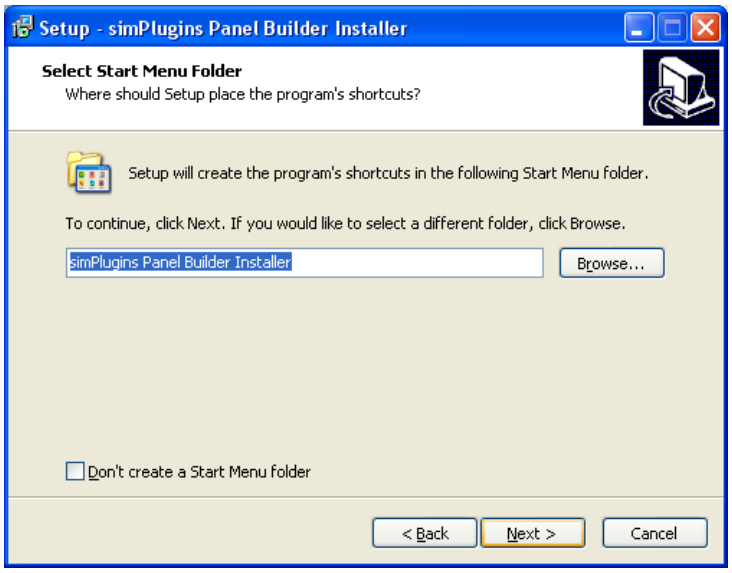
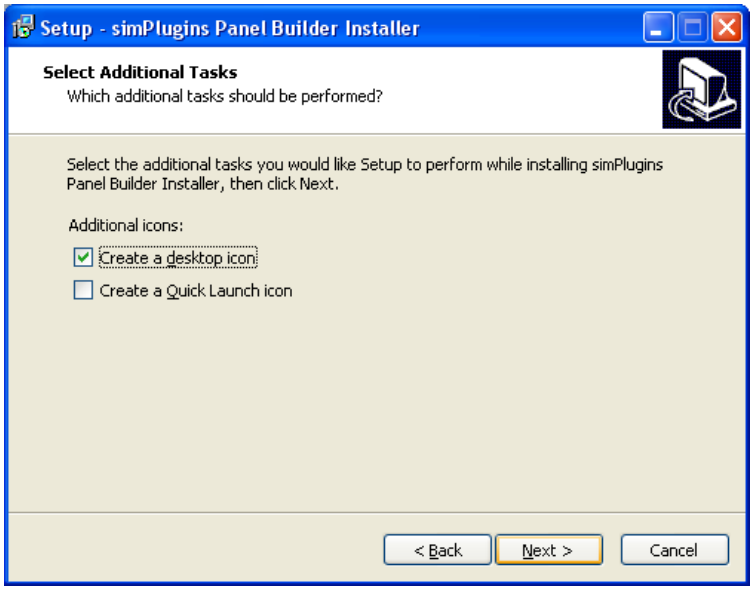

Setup - simPlugins Panel Builder Installer
Select Start Menu Folder
Where should Setup place the program's shortcuts?
Setup will create the program's shortcuts in the following Start Menu folder.
To continue, click Next. If you would like to select a different folder, click Browse.
simPlugins Panel Builder Installer
Browse...
Don't create a Start Menu folder
< Back
Next >
Cancel

Here you have the option to create a Start Menu folder, or click on 'Don't create…'
Click on [Next >]


Setup - simPlugins Panel Builder Installer
Select Additional Tasks
Which additional tasks should be performed?
Select the additional tasks you would like Setup to perform while installing simPlugins Panel Builder Installer, then click Next.
Additional icons:
Create a desktop icon
Create a Quick Launch icon
< Back
Next >
Cancel

Here you can specify to create any icons for the installer. Click [Next >]

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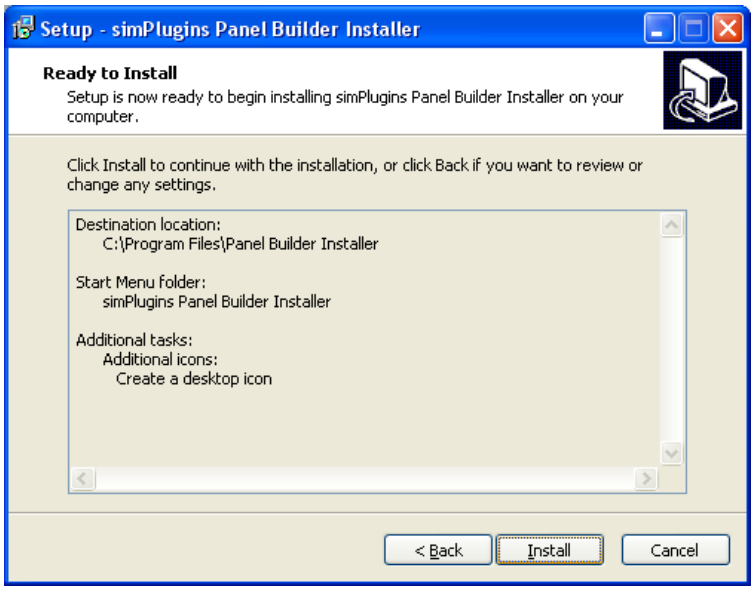
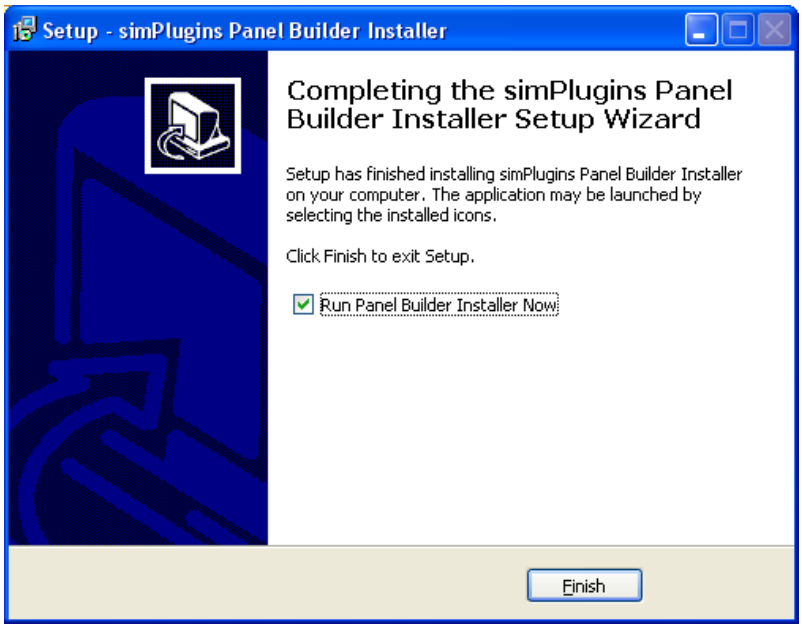

Setup - simPlugins Panel Builder Installer
Ready to Install
Setup is now ready to begin installing simPlugins Panel Builder Installer on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
Destination location:
C:\Program Files\Panel Builder Installer
Start Menu folder:
simPlugins Panel Builder Installer
Additional tasks:
Additional icons:
Create a desktop icon
< Back
Install
Cancel

Review your chosen options, then click on [Install].

Wait for the install to finish.


Setup - simPlugins Panel Builder Installer
Completing the simPlugins Panel Builder Installer Setup Wizard
Setup has finished installing simPlugins Panel Builder Installer on your computer. The application may be launched by selecting the installed icons.
Click Finish to exit Setup.
Run Panel Builder Installer Now
Finish

The installation has finished, click on the [Finish] button.

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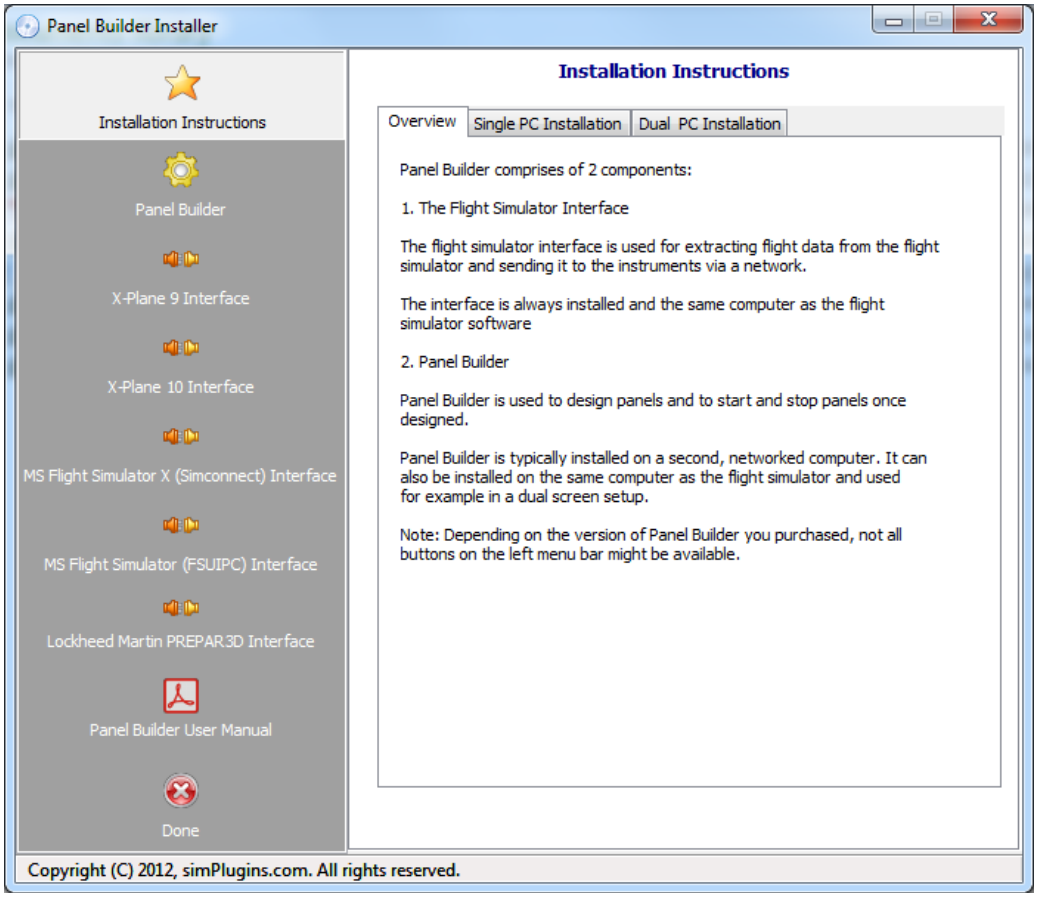
Step 2 – Install Panel Builder Modules

On each computer that is part of your flight simulation system, launch the Panel Builder Installer and select the module(s) from the list as appropriate for the computer. See the *Integration Scenarios* chapter for a recap what is required on each computer for each scenario.


Panel Builder Installer
Installation Instructions
Panel Builder
X-Plane 9 Interface
X-Plane 10 Interface
MS Flight Simulator X (Simconnect) Interface
MS Flight Simulator (FSUIPC) Interface
Lockheed Martin PREPAR3D Interface
Panel Builder User Manual
Done
Installation Instructions
Overview
Single PC Installation
Dual PC Installation
Panel Builder comprises of 2 components:
1. The Flight Simulator Interface
The flight simulator interface is used for extracting flight data from the flight simulator and sending it to the instruments via a network.
The interface is always installed and the same computer as the flight simulator software
2. Panel Builder
Panel Builder is used to design panels and to start and stop panels once designed.
Panel Builder is typically installed on a second, networked computer. It can also be installed on the same computer as the flight simulator and used for example in a dual screen setup.
Note: Depending on the version of Panel Builder you purchased, not all buttons on the left menu bar might be available.
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When selecting a module from the left side, the right side will show a short description and will also contain a button to start the install for the module selected.

Proceed now to install the module(s) required on each computer. Afterwards, click on the *Exit* icon on the left.

Go to section Operation on how to us it.

You can skip the network configuration. There is no need to change any values; the defaults should work in 99% of all installations.

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Step 3a - Network Configuration

All modules of Panel Builder communicate using a network protocol. The Interface software receives data from the flight simulator and sends the appropriate data to each instrument, either on the same computer or to additional computers. Even if both the flight simulator software and Panel Builder is installed on the computer, communication is still performed using the network protocol.

Each Flight Simulator Interface and Panel Builder has a configuration screen for setting networking parameters. Following the scenarios described in previous chapters, each scenario has a different network configuration.

Furthermore, network configuration requires also port numbers for each component of Panel Builder, including Instruments. Port Numbers use a default setting after installation of Panel Builder and will not need to be changed in most cases. There are circumstances were a port number is already in use by a different program than Panel Builder. In this case the port number will need to be changed to a different value.

In summary, there is no network configuration necessary after the installation.

All components of Panel Builder have been preset and those values should work for 99% of all installations. The following pages are for your information and in the rare case where you need to make changes to the network.

What is a Multicast Group Address?

A Multicast Group Address is a special IP Address that has been reserved for performing communications between groups of programs. It works like a subscription where all programs wanting to communicate with each user subscribe to the same Group Address.

In order to support more than one instrument computer and to allow multiple use of an instrument in the same panel, the multicast broadcasting scheme is used. A *Multicast Group Address* has to be set in the flight simulator interface programs and Panel Builder. The Multicast Group Address is an address that all parts of Panel Builder communicate through on your network.

The Multicast Group Address is the same for all Interfaces and Panel Builder. There is a fixed range of valid addresses. They are in the range between

224.0.0.0 and *239.255.255.255*

Panel Builder and all Interfaces have been preset to ***224.11.5.62***. This does **not** need to be changed unless you have another program using this address, which is highly unlikely.

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Changing the Multicast Group Address – Write down your value.

Computer	Default	Your Value
Multicast Group Address	*224.11.5.62*	

This address needs to match in each module of Panel Builder, the Interfaces and Panel Builder itself.

The address has to be in the range of 224.0.0.0 and 239.255.255.255 . Choose any address within the valid range and make a note of it above.

Continue in the next chapters with Interface Configuration and Panel Builder Configuration.

Changing Port Numbers – Default values are shown. Typically use those values. If you need to change them, make a note in the last column

Module	Name	Default Port Number	Your Port Number
Panel Builder	Listen Port	48000	
X-Plane Interface	Receive Port Number	45000	
FSX Interface	Receive Listening Port	45000	
FSUIPC Interface	Receive Listening Port	45000	
Prepar3D Interface	Receive Listening Port	45000	

Instrument Port Numbers are listed in the Instrument Reference Section of this manual.

Continue with the next chapter to configure all modules of Panel Builder and refer back to both tables above to help with the configuration.

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Step 3b - Interface Configuration

Configure the X-Plane 9 Interface (for X-Plane 9 and X-Plane 10.1)

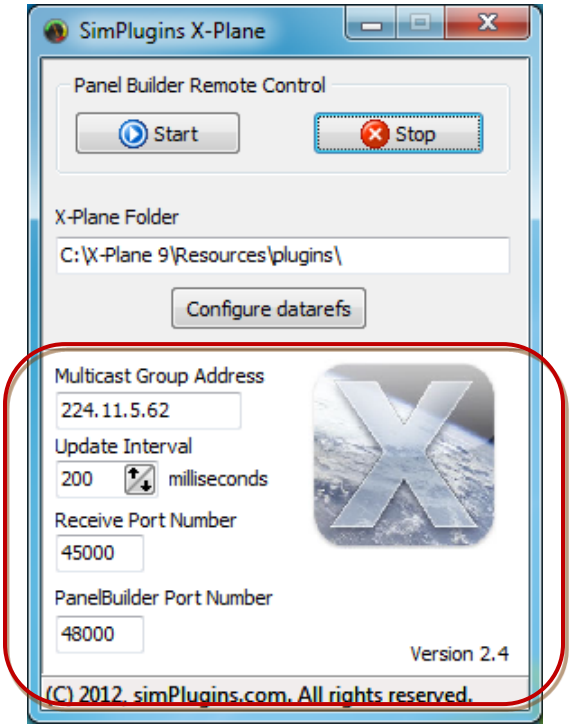
There is no need to change any values; the defaults should work in 99% of all installations.

The plugins for x-plane where installed in the previous step under your X-Plane folder

```
C:\X-Plane 9\resources\plugins
```

There are 4 files, 2 plugins and 2 configuration files for the plugins.

- `InstrumentPlugin.xpl`
- `InstrumentPlugin.ini`
- `InstrumentReceiver.ini`
- `InstrumentReceiver.xpl`



Start the Application 'simPlugins X-Plane'.

This application is located on your flight simulator PC where X-Plane is installed on. There is an icon on the desktop for it.

X-Plane Folder	this is the folder where the X-Plane plugin is installed
Multicast Group Address	the **broadcast address** for the network of your flight simulator system. 224.11.5.62 is the default. No need to change it unless you have another program using it.
Update Interval	How often X-Plane sends data to the Instruments PC
Receive Port Number	The port number the interface listens on for data received from Instruments. 45000 is the default.
Panel Builder Port Number	The listening port as configured in Panel Builder

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Configure the X-Plane 10 Interface (for X-Plane 10.20 or greater)

There is no need to change any values; the defaults should work in 99% of all installations.

The plugins for x-plane where installed in the previous step under

```
C:\X-Plane 10\resources\plugins
```

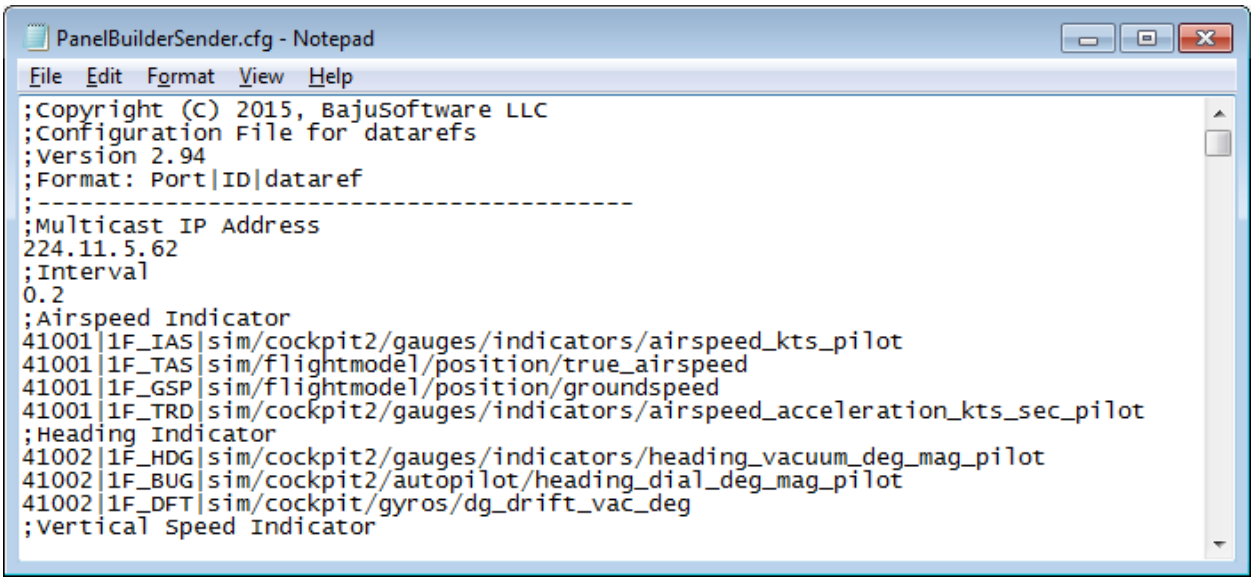
There are 3 configuration files for the plugin.

In folder `C:\X-Plane 10\resources\plugins\PluginPanelBuilderSender` In folder `C:\X-Plane 10\resources\plugins\PluginPanelBuilderReceiver`

PaneBuilderSender.cfg

PanelBuilderReceiverDAT.cfg
PanelBuilderReceiverCMD.cfg

The first part of the network settings are in PanelBuilderSender.cfg:



Multicast IPAddress	the **broadcast address** for the network of your flight simulator system. 224.11.5.62 is the default. No need to change it unless you have another program using it.
Interval	How often X-Plane sends data to the Instruments PC in Seconds (0.2 seconds = 200 milliseconds)

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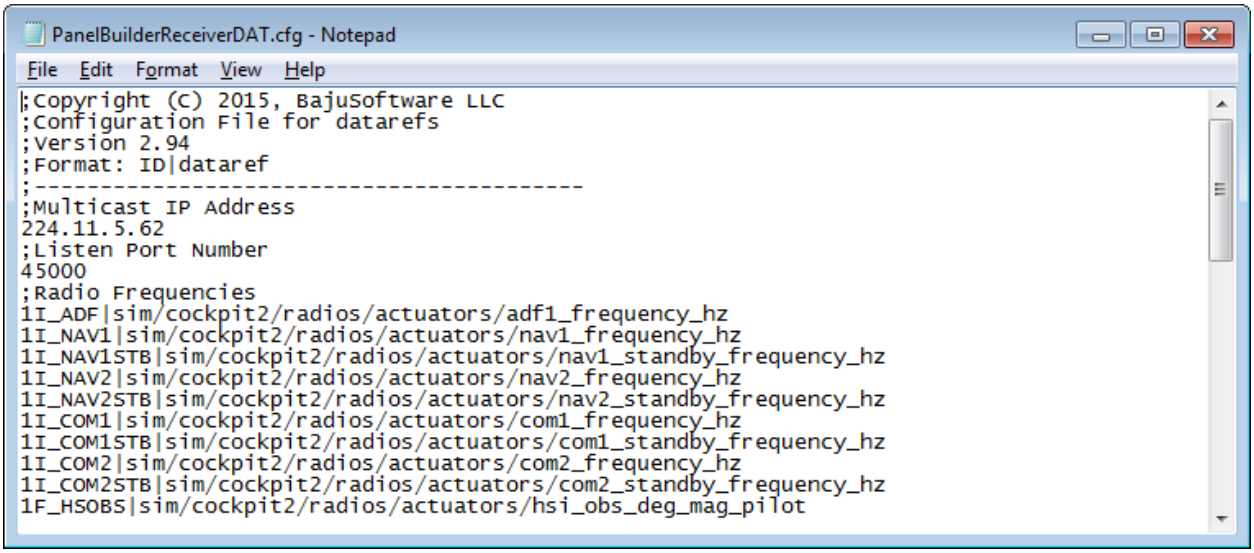
The rest is in PanelBuilderReceiverDAT.cfg



Multicast IP Address — the **broadcast address** for the network of your flight simulator system. 224.11.5.62 is the default. No need to change it unless you have another program using it.

Receive Port Number — The port number the interface listens on for data received from Instruments. 45000 is the default.

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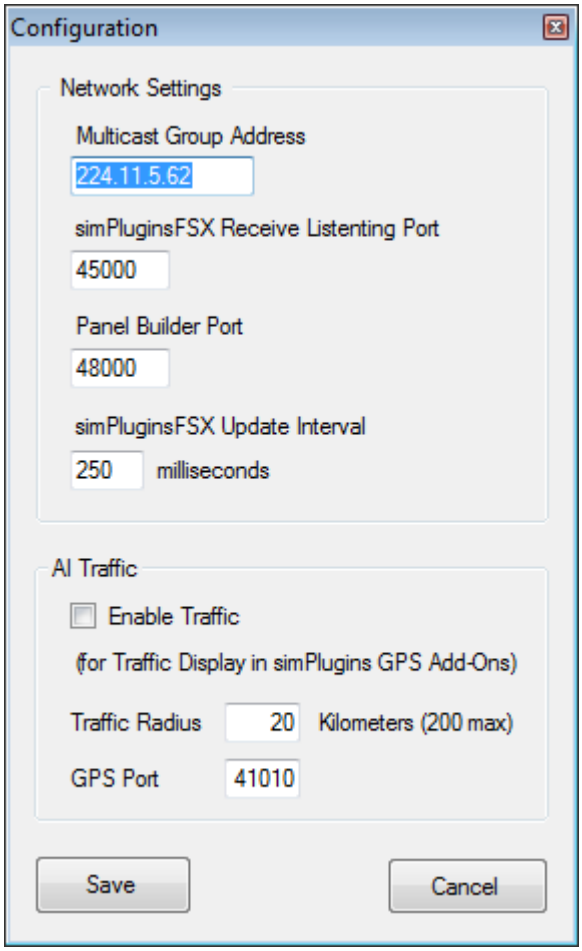
Configure the MS Flight Simulator SimConnect Interface

There is no need to change any values; the defaults should work in 99% of all installations.

Launch the simPluginsFSX program.



Click on the [Network Configuration] Button.

Multicast Group Address is the **broadcast IP address** of the network of your flight simulator system. (Default: 224.11.5.62)

simPluginsFSX Receive Listening Port specifies the port number the simPluginsFSX Interface 'listens' on. This is used for receiving settings from the instruments for example setting the barometer in the Altimeter. This setting has to match what has been configured under ***Setting the Flight Simulator IP Address*** in chapter ***Panel Builder Configuration***.

Panel Builder Port is the listening port as configured in Panel Builder.

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The *simPluginsFSX Update Interval* specifies how often the data is updated to the instruments in milliseconds. Here it is 250 milliseconds.

AI Traffic specifies whether to enable AI Traffic output through the interface. You only need to enable this if you use any Panel Builder Add-Ons that provide traffic information.

Click on [Save] to save the settings.

Start MS-Flight Simulator then click on the [Connect] button in simPluginsFSX. The Interface is now ready. Note: Microsoft Flight Simulator has to be running!

There is a command line option called ‘start’ that allows automatic connect on program startup.

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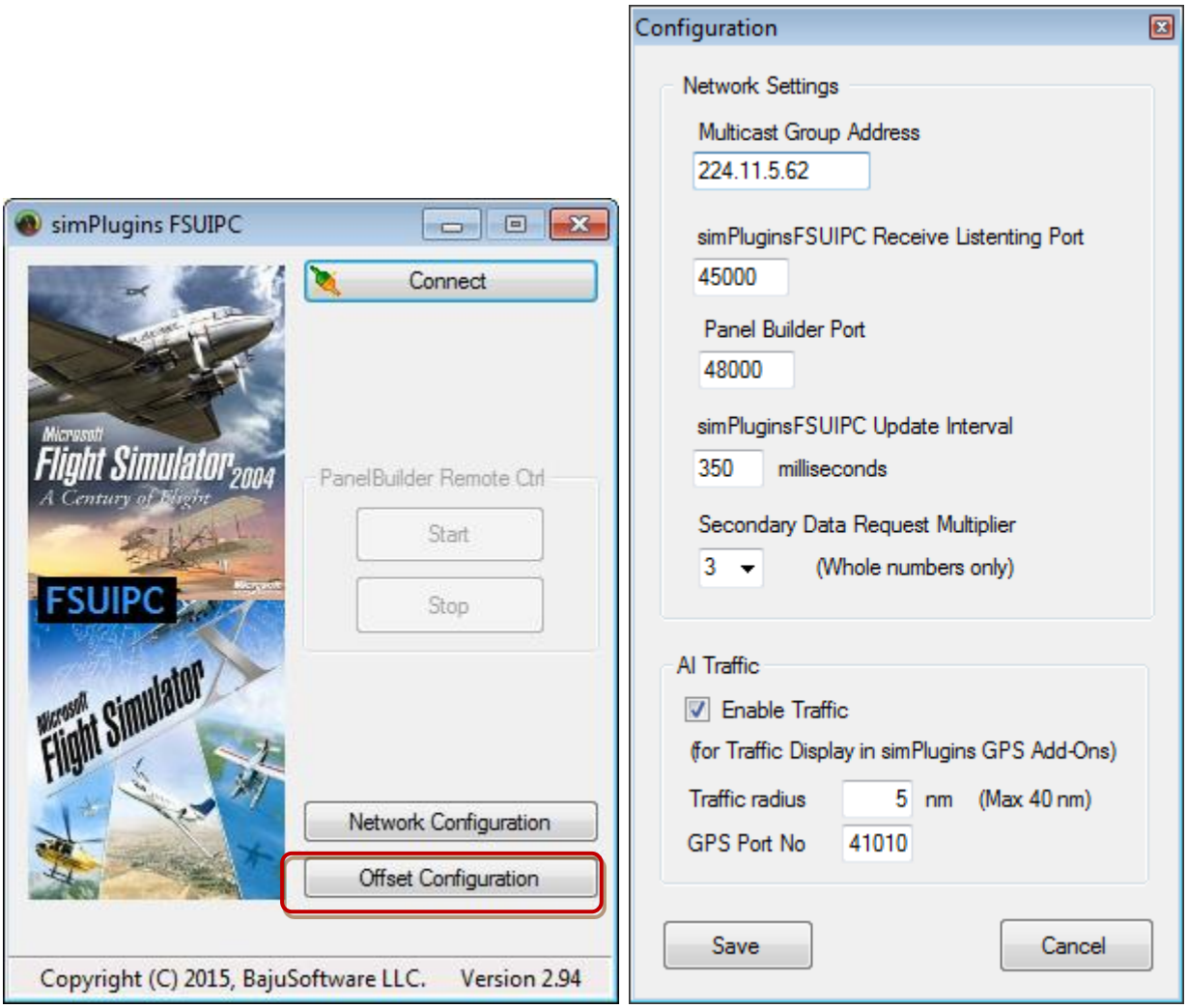
Configure the MS Flight Simulator FSUIPC Interface

There is no need to change any values; the defaults should work in 99% of all installations.

Launch the simPluginsFSUIPC program.



Click on the [Network Configuration] Button.

Multicast Group Address is the **broadcast IP address** of the network of your flight simulator system. (Default: 224.11.5.62)

simPluginsFSUIPC Receive Listening Port specifies the port number the simPlugins FSUIPC Interface 'listens' on. This is used for receiving settings from the instruments for example setting the barometer in the Altimeter. This setting has to match what has been configured under ***Setting the Flight Simulator IP Address*** in chapter ***Panel Builder Configuration***.

Panel Builder Port is the listening port as configured in Panel Builder.

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The *simPluginsFSUIPC Update Interval* specifies how often the data is updated to the instruments in milliseconds. Here it is 250 milliseconds.

Secondary Data Request Multiplier specifies the update interval for less frequent instrument updates. It multiplies the Update Interval by the entered value.

AI Traffic specifies whether to enable AI Traffic output through the interface. You only need to enable this if you use any Panel Builder Add-Ons that provide traffic information.

Click on [Save] to save the settings.

Start MS-Flight Simulator then click on the [Connect] button in simPluginsFSUIPC. The Interface is now ready. Note: Microsoft Flight Simulator has to be running!

There is a command line option called ‘start’ that allows automatic connect on program startup.

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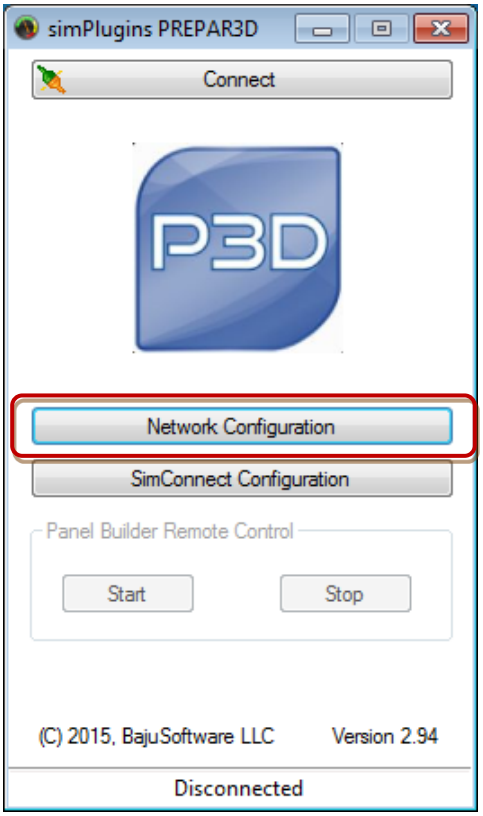
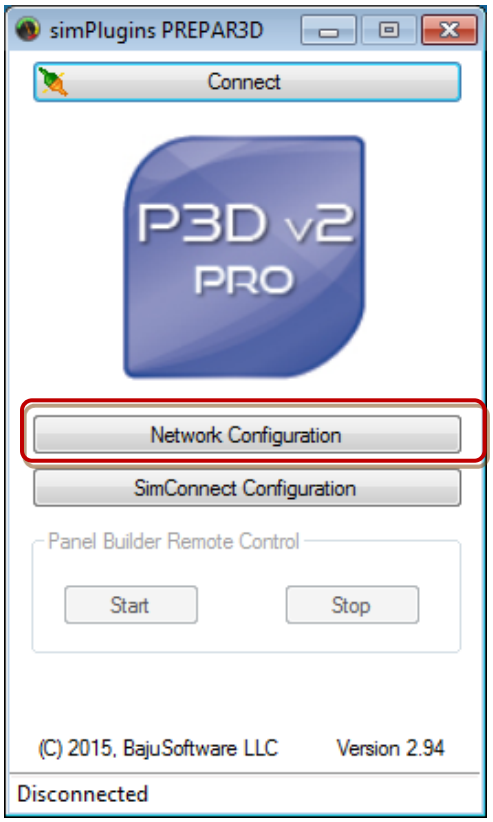
Configure the Lockheed Martin Prepar3D SimConnect Interfaces (V1 & V2)

There is no need to change any values; the defaults should work in 99% of all installations.

Launch the simPluginsPrepar3D or simPluginsPrepar3D V2 program.



OR



Click on the [Network Configuration] Button.

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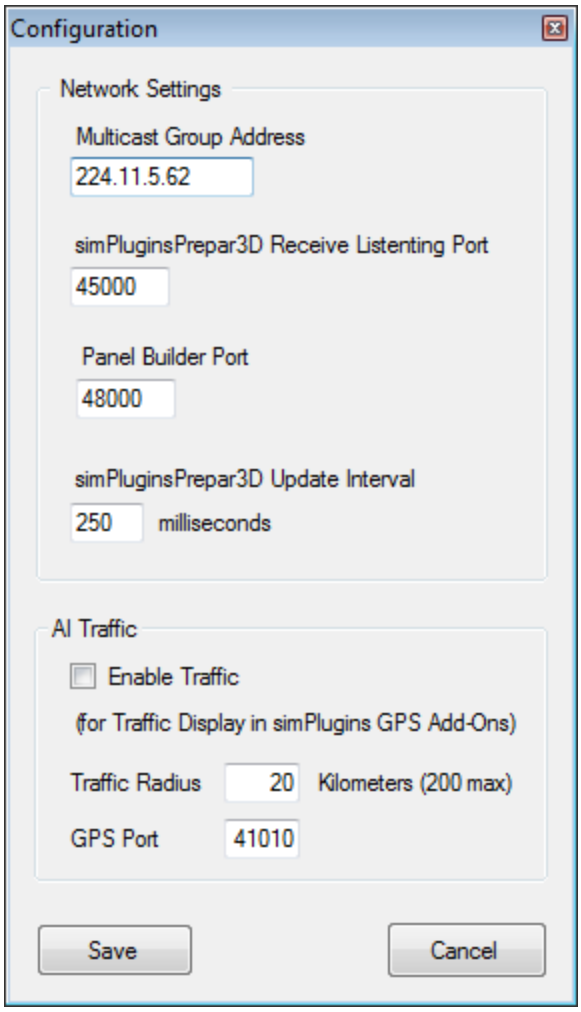

Multicast Group Address is the **broadcast IP address** of the network of your flight simulator system. (Default: 224.11.5.62)

simPluginsPrepar3D Receive Listening Port specifies the port number the simPluginsPrepar3D Interface 'listens' on. This is used for receiving settings from the instruments for example setting the barometer in the Altimeter. This setting has to match what has been configured under ***Setting the Flight Simulator IP Address*** in chapter ***Panel Builder Configuration***.

Panel Builder Port is the listening port as configured in Panel Builder.

The *simPluginsPrepar3D Update Interval* specifies how often the data is updated to the instruments in milliseconds. Here it is 350 milliseconds.

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AI Traffic specifies whether to enable AI Traffic output through the interface. You only need to enable this if you use any Panel Builder Add-Ons that provide traffic information.

Click on [Save] to save the settings.

Start Prepar3D then click on the [Connect] button in simPluginsPrepar3D. The Interface is now ready. Note: Prepar3D has to be running!

There is a command line option called ‘start’ that allows automatic connect on program startup.

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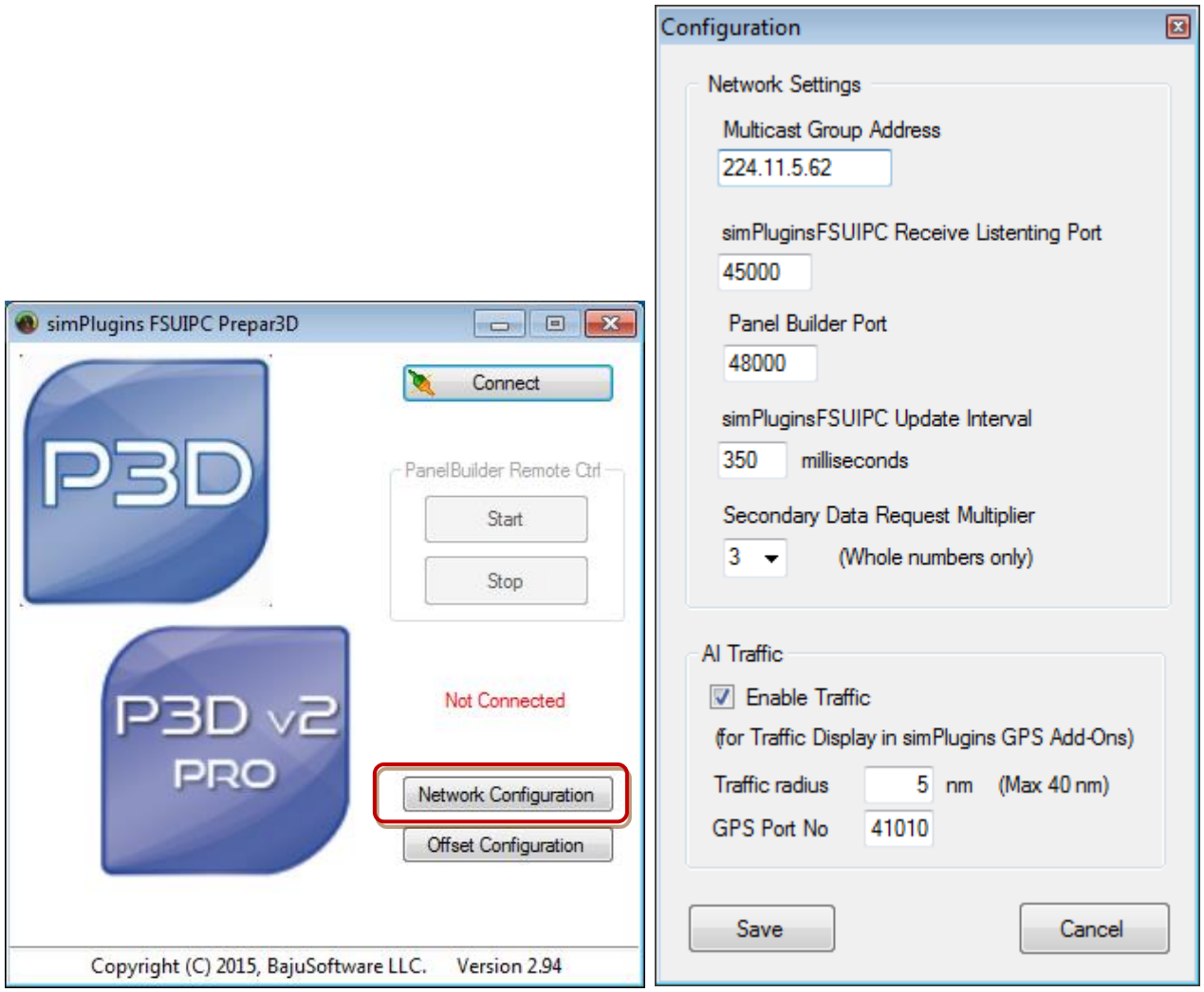
Configure the Lockheed Martin Prepar3D FSUIPC Interface

There is no need to change any values; the defaults should work in 99% of all installations.

Launch the simPlugins FSUIPC Prepar3D program.



Click on the [Network Configuration] Button.

Multicast Group Address is the **broadcast IP address** of the network of your flight simulator system. (Default: 224.11.5.62)

simPluginsFSUIPC Receive Listening Port specifies the port number the simPlugins FSUIPC Interface 'listens' on. This is used for receiving settings from the instruments for example setting the barometer in the Altimeter. This setting has to match what has been configured under ***Setting the Flight Simulator IP Address*** in chapter ***Panel Builder Configuration***.

Panel Builder Port is the listening port as configured in Panel Builder.

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The *simPluginsFSUIPC Update Interval* specifies how often the data is updated to the instruments in milliseconds. Here it is 250 milliseconds.

Secondary Data Request Multiplier specifies the update interval for less frequent instrument updates. It multiplies the Update Interval by the entered value.

AI Traffic specifies whether to enable AI Traffic output through the interface. You only need to enable this if you use any Panel Builder Add-Ons that provide traffic information.

Click on [Save] to save the settings.

Start MS-Flight Simulator then click on the [Connect] button in simPluginsFSUIPC. The Interface is now ready. Note: Microsoft Flight Simulator has to be running!

There is a command line option called ‘start’ that allows automatic connect on program startup.

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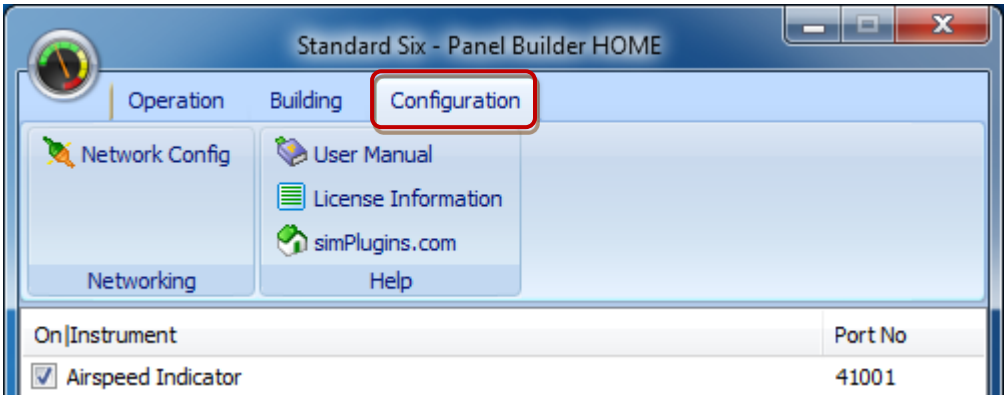
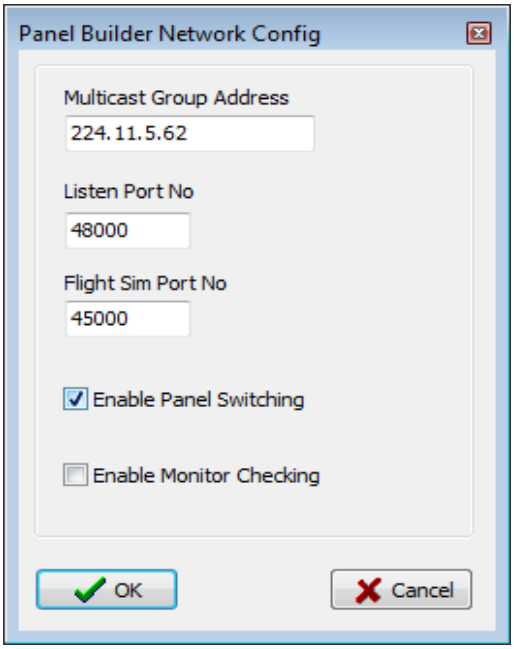
Step 3c – Panel Builder Configuration

There is no need to change any values; the defaults should work in 99% of all installations.

Start Panel Builder and select the ***Configuration*** tab.



Changing the Network Configuration



Multicast Group Address

The Multicast Group Address (default 224.11.5.62) can be left as is. It has to match all other Multicast Group Addresses configured.

Listen Port No

This is the port number Panel Builder will use when receiving data. The default is 48000.

Flight Sim Port No

This number has to match the Port Number as configured in the flight simulator interface application. The default is *45000*. See also chapter ***Interface Configuration***

Enable Panel Switching

Enables the automatic switching of panels. See the *Adding a new panel* section.

Enable Monitor Checking

Before starting a panel, check if the monitor configuration is the same as when the panel was built and gives a warning.

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Help

The help section has shortcuts to the User Manual, License Information and the simPlugins website for your reference.

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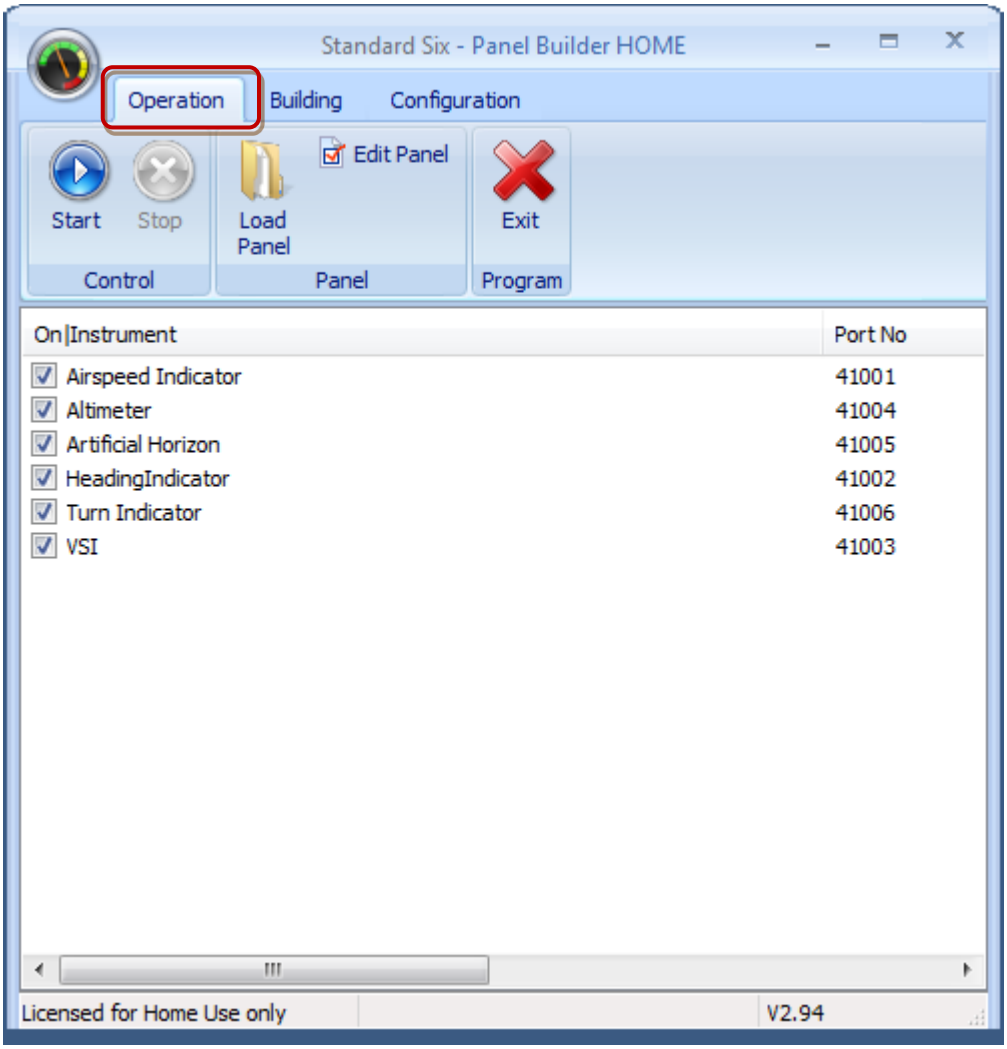
Operation

After installation, you should have an icon for 'Panel Builder' on your desktop where you installed the instruments on. Double click it. This will launch the Panel Builder Program that allows you to

- Start and Stop all Instruments for a panel
- Build new panels
- Set the IP Address and Port Number to connect to the flight simulator interface

Select the *Operation* tab.



By default, the last panel used will be loaded automatically. This display shows what instruments are part of the panel and their associated Port Numbers. Those port numbers match the Instrument Interface Configuration for the specific instrument.

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Launching a Panel

Select a panel by clicking the **Load Panel** icon and selecting a panel from the list.

Click on the **Start** button. All shown instruments that have a checkmark next to them will be started and shown on computer screen and the Panel Builder program will be minimized.

Each Instrument's position is saved with the panel configuration. You can re-locate an Instrument by simply dragging it to a new position on the screen. There is a facility to 'lock' the instruments to the position to avoid accidentally moving it. ***Right Click*** on the instrument and a menu will be shown. Click on 'Lock' to toggle the lock/not locked option.

Now you can start your flight simulator and your instruments should come alive!

Note: Once started, you cannot make any changes to the panel configuration. You need to stop it first.

Note: When using Microsoft Flight Simulator or PREPAR3D you also need to click on the [Connect] button in the simPluginsFSX , simPluginsFSUIPC or simPluginsPrepar3d program on your flight simulator computer to establish a connection after you started the flight simulator program.

Stopping a Panel

As mentioned previously, when a panel is started the Panel Builder program is minimized to the task bar. Click on the minimized icon and it will show again.

Now click the STOP button.

Display on Desktop

All instruments are separate programs that will show on your desktop. The Panel Builder program will hide the windows desktop, set the background image or the background color as configured for each panel. (See the *Building Panels* section) and suspend the screen saver if used.

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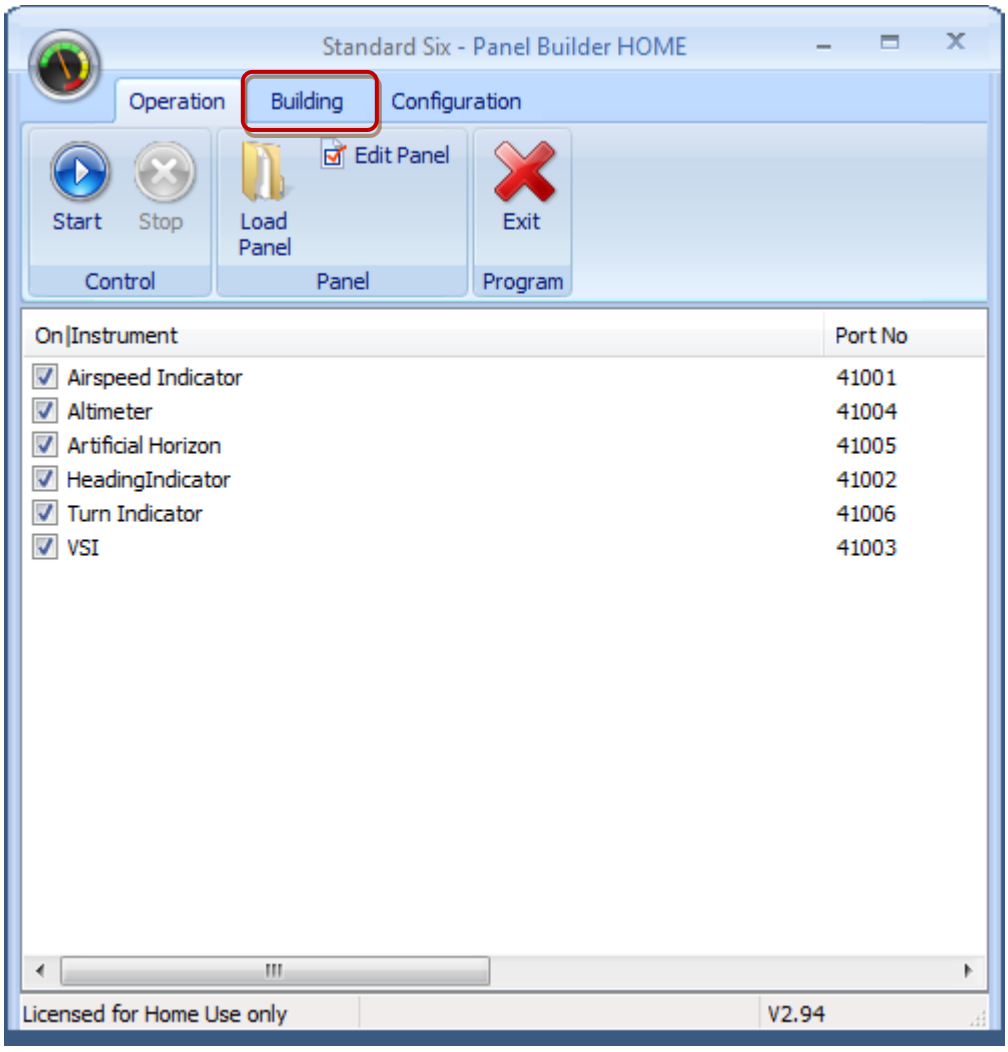
Building Panels

Multiple panels can be configured for different aircraft types. Each panel configuration contains

- Name of the panel (e.g. the aircraft type)
- A background Image or a Background Color
- Instruments included in panel
- Position and size of each instrument on the screen.

Select the ***Building*** tab.



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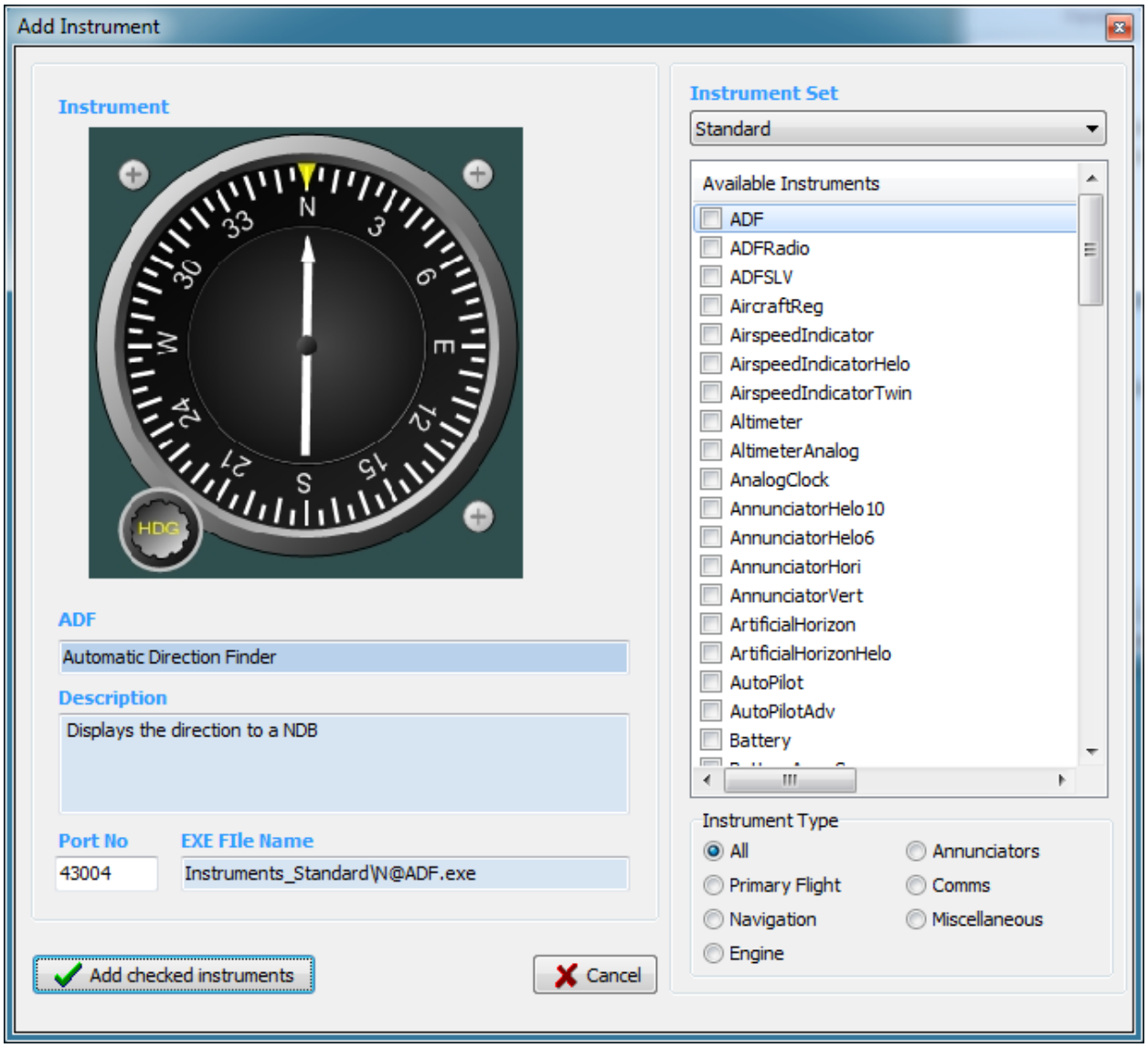
Modifying an existing panel

Choose a panel by clicking the **Open Panel** icon under the operation tab and select a panel from the list. The click on the Building tab.

Adding an instrument



Click on *Add Instrument*. The window as shown above will appear.

All available Instruments are shown on the right side. Scroll through the list until you locate the required instruments. You can also filter instruments by instrument type by selecting the appropriate section in the box labeled *Instrument Type*.

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The dropdown *Instrument Sets* shows all Instruments for a particular group of instruments, typically instrument add-ons. The dropdown will show all instrument add-ons you have purchased and installed. 'Standard' is the instrument set that came with Panel Builder. You can choose instruments form any instrument set to build a panel.

An image and description will be shown for each instrument.

The Port Number will be filled in automatically choosing the default port of the instrument.

Check each instrument to be added to the panel and click on [Add checked instruments]

To set the location of an Instrument, the panel needs to be 'started'.
Click on the ***Start*** Button. (See chapter **Operation** for more information).

All instruments initial position is in the top left corner. So it will happen that all newly added instruments sit on top of each other. Simply drag each instrument into its final position.

Stop the panel and at that stage the position of each instrument is saved.

To configure each instrument for the aircraft type the panel is intended for, see the chapter **Instrument Reference**.

Removing an instrument from the panel

The delete an instrument, select the instrument in the list and click on the **Remove** button.

Moving and Resizing an Instrument in a panel

Those operations require that a panel is 'running', i.e. the panel has been started and all instruments of the panel are displayed.

By default all instruments are placed at the top left corner of the monitor. To move it to its proper location, left click and drag the instrument around the monitor.

To resize and instrument left click (and release) on the instrument, then either use you mouse wheel or the [+] and [-] buttons on the numeric keypad.

Note: To lock an instruments size and position, right click on the instrument and select 'Lock' from the menu. To un-lock, repeat the operation.

Note: To reset the position of an instrument to the top left corner of the 1st Monitor select the instrument in the instrument list of Panel Builder and choose the Building/Reset Position in the menu.

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Modifying an instrument

Select an instrument in the list and click on the ***Edit Settings*** button in the Instrument menu section. You can also double-click it.

You can only modify the port number of the instrument..

Note: If you modify the port number, you also have to modify the port number in the appropriate Interface Configuration. See chapter **Interface Modification**.

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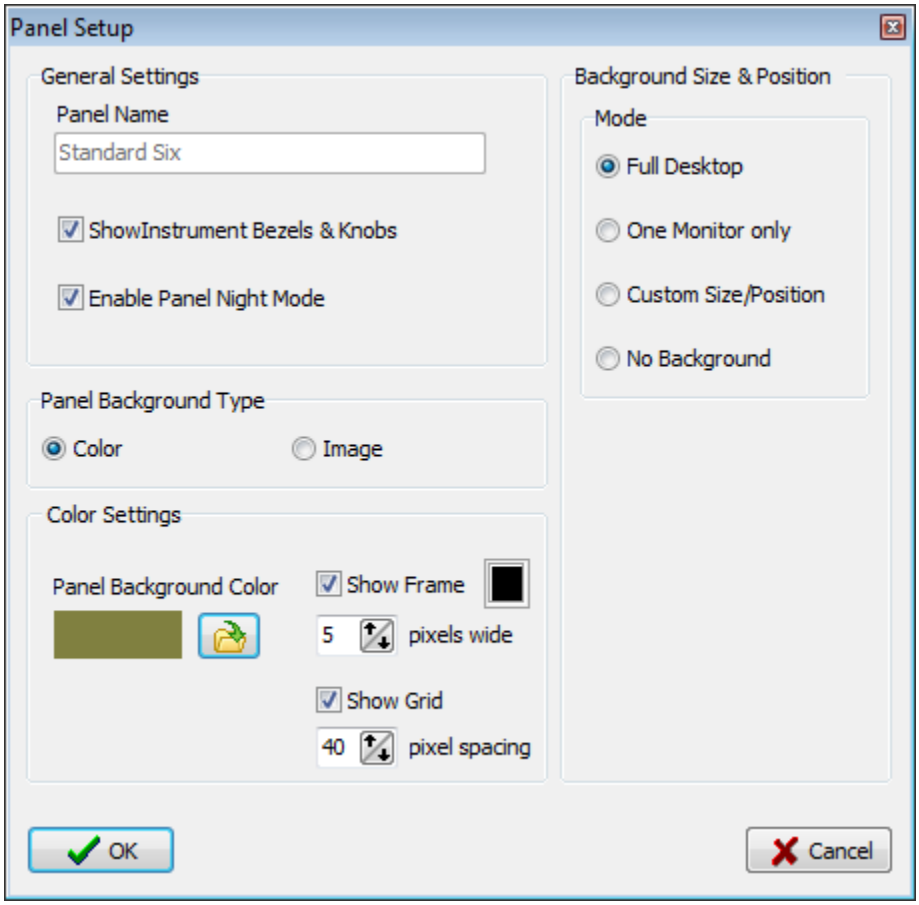
Adding a new panel

To add a new panel, click on the ***New Panel*** button in the Panels menu section.



Panel Name: Enter the name of the panel e.g. the aircraft type.

Show Instrument Bezels & Knobs. This will either show/or hide the bezels, mounting screws and any knobs for the instruments.

This is useful for cockpit builders who use a mask in front of the monitor. A mask could be made from cardboard or other thin material, or if a monitor is integrated into a full instrument panel.

Enable Panel Night Mode

This will automatically switch all instruments in the panel to a 'red glow' color for night flying. The switching occurs when the time in the flight simulator switches to night time.

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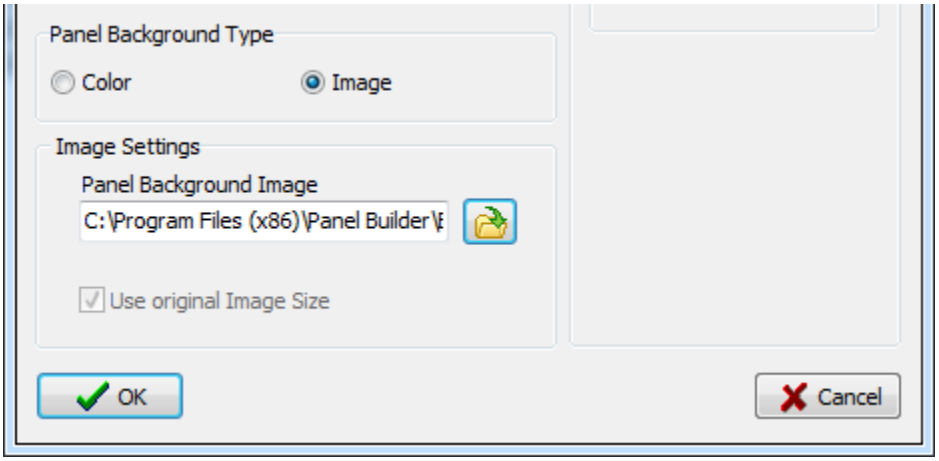
Panel Background Type:

Select between colored background and an image.

Color Background: Specify the color and an optional colored frame.

Image Background: Specify the image file and if you want to retain the original image size of a custom size.



Background Size and Position

Four options are available:

Full Desktop

This fills the desktop area with the selected color or image. If you have multiple monitors connected it will span all monitors.

One Monitor only

As above, but the background will be restricted to the monitor specified. This only applies only to multi-monitor setups.

Custom Size and Position

Here you can specify what size and what position the background should be. This is useful if you don't want a background that fills a whole monitor.

No Background

Just as the name implies. The instruments will be placed on the desktop as is.

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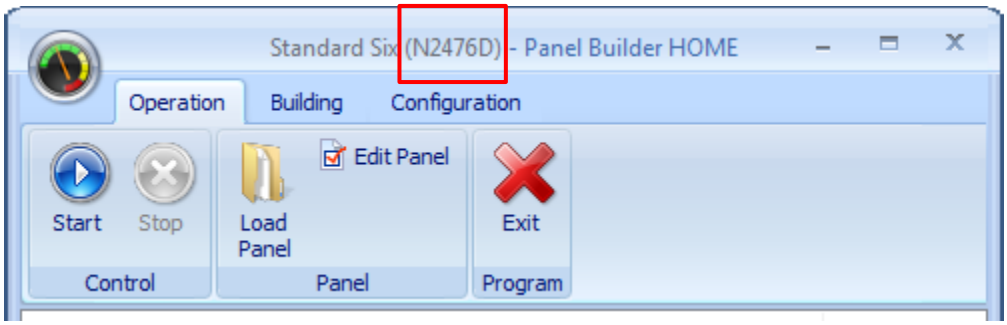
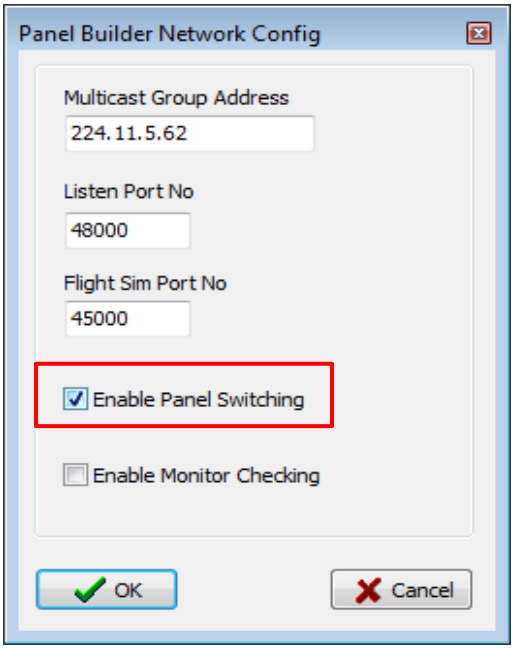
Adding a new panel (automatic panel switching)

As of Version 2.94, you can create panels that automatically switch to the appropriate aircraft when loaded by the flight simulator. You can create a specific panel for each aircraft you have in your flight simulator. Whenever you switch the aircraft in your simulator, Panel Builder will load automatically the matching panel.

All you have to do is name your panel after the ATC call sign of the aircraft. As of Version 2.94 the ATC call sign is displayed in the top bar of Panel Builder to make this easier. Your Flight Simulator has to be started of course the aircraft you want to use has to be loaded:



In this case the call sign is ***N2476D***. Now create a new panel and give it the Panel Name ***N2476D***. Proceed to add instruments to the panel as usual.



Now, the final thing to do is to enable automatic panel switching. Go to the menu *Configuration/Network Configuration*:

Click on Enable Panel Switching. That's it.

Now continue adding panels for your other aircraft. All you need to do is to load the aircraft into your simulator and the call sign will be displayed.

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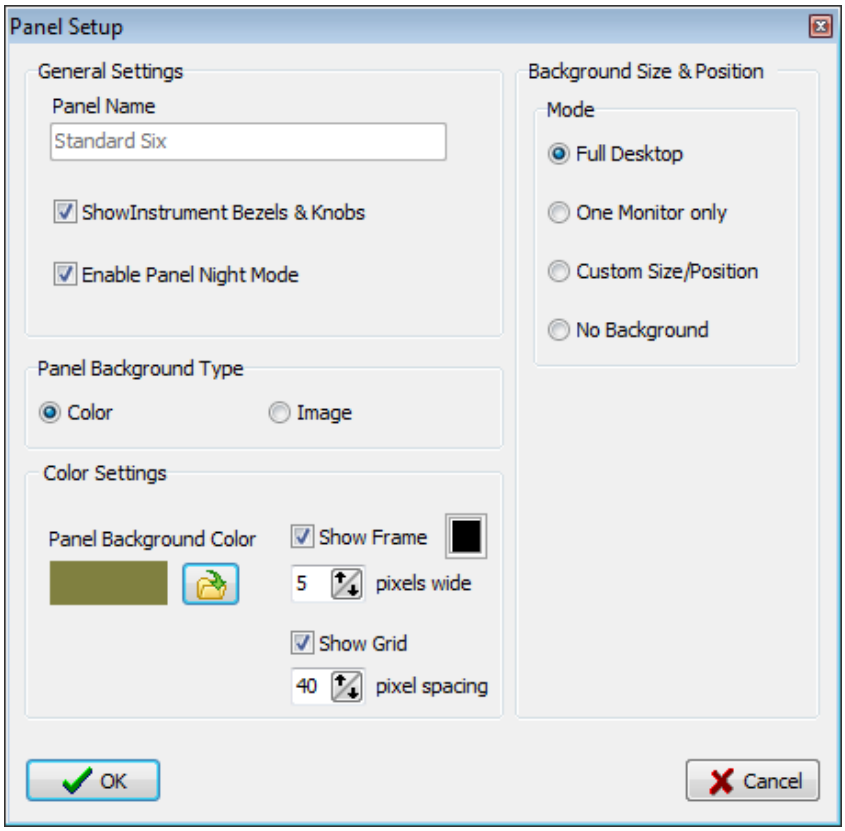
Modifying a panel

The panel configuration (not the instruments within a panel) can be modified using the **Edit Panel** button in the Panels menu section. To modify an instrument see chapter ***Modifying an instrument.***

Follow the steps as described in the *Adding a new panel section*. **Note that the Panel Name cannot be modified!**



Deleting a panel

To delete a panel click on the **Delete Panel** button in the Panels menu section. Please note that the configuration for all Instruments in that panel will also be deleted.

Copying a panel

To copy panels click on the **Copy Panel** button in the Panels menu section. You will be prompted for a new Panel Name. After entering a new name, the current panel will be copied and the copied panel with the new name will be opened.

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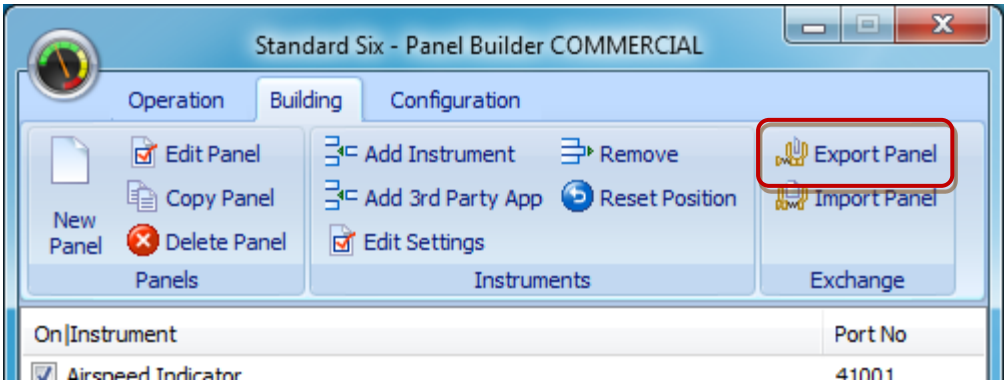
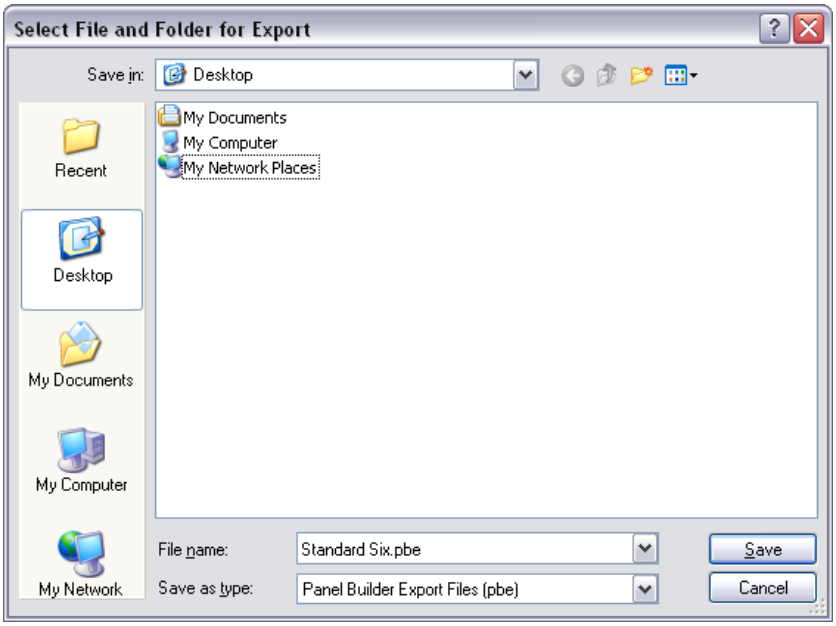
Exporting a panel

This function allows you to export a complete panel configuration and import it on another computer with Panel Builder installed. All instrument locations, sizes and configurations and the panel background will be exported. *This function requires the Commercial Version*.

Choose the *Building* tab, then *Export Panel*.



A dialog will show to select where the export file should be saved to. This can be a local drive, a networked computer drive or a thumb drive.



Click on [Save] to finalize the export function.

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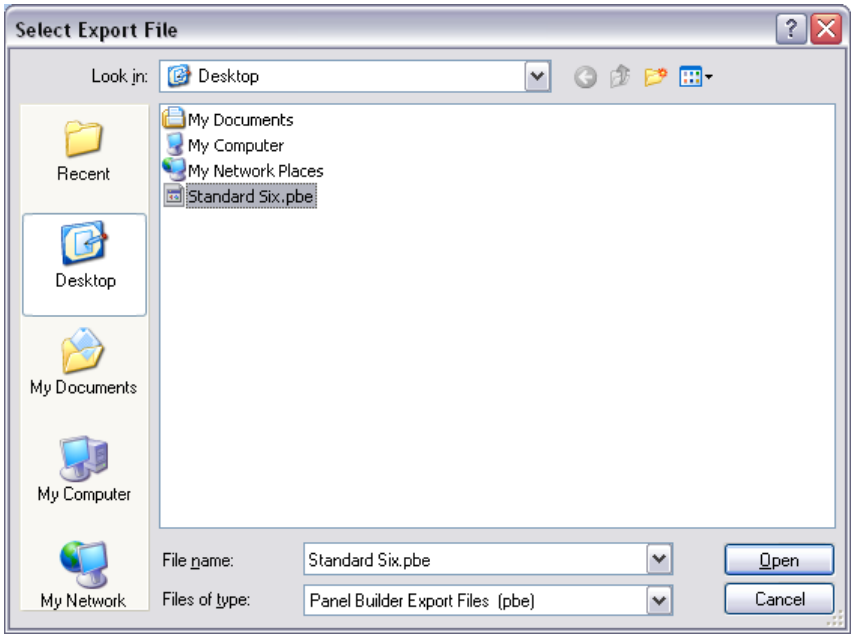
Importing a panel

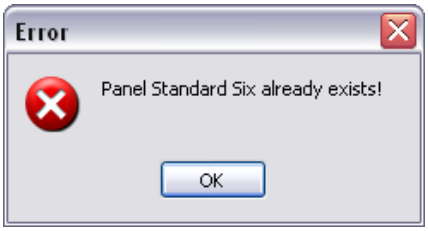
This allows you to import a previously exported panel configuration. Please note that when importing a panel that the screen size of the exported panel is the same size or less then the screen size of the target computer. *This function requires the Commercial Version*.

Chose the **Building** tab, then **Import Panel**

A dialog will show to select where the export file should be imported from. Browse to the location where the export file was saved to and click on [Open].



If the same panel exists already, a warning will be displayed. Otherwise the panel will be imported.



Note: You can rename the Export File before importing it. The file name will become the panel name after importing.

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Tips and Tricks

Where can I find the Panel Builder Installer?

The installer is provided on a USB Key or a downloaded file. Find the drive letter of the USB Key or the download file in Windows Explorer and double click PanelBuilderInstaller.exe

C:\ProgramFiles (X86)\Panel Builder Installer

How can I change the Banner Image on the bottom of the Panel Builder screen?

There is a filed called BannerImage.jpg in the Panel Builder program Files folder. Replace this file with your own version. For correct display, create an image file with the following dimensions: 484 pixels wide by 60 pixels high. ***This requires the Panel Builder Commercial Version.***

'Exception received' shows up in simpluginsFSX and the instruments don't update

This means that the FSX Interface could not be started. Make sure you have the correct version of MS Flight Simulator (Acceleration Pack or Service Pack 2) installed. Another problem can be that the .ini file is corrupt for the FSX Interface. Try to re-install the FSX Interface from the Panel builder Installer.

All instruments are cut-off at the bottom right (instruments are only partially visible)

Make sure that the text size is set to 100% in Windows Control Panel/ Display.

Instrument XXX doesn't update

This is very likely an issue with the port number configuration. Make sure that both port numbers are the same in Panel Builder and the Instrument Interface.

Where can I set the instrument ranges and color arcs?

Each instrument has a menu that can be accessed by right-clicking on an instrument and selecting the **Settings** options. Not all instruments have a settings option.

I accidentally move Instruments when using the knobs.

Each instrument can be locked into its position by right-clicking on the instrument and selecting **Lock.**

We have a comprehensive FAQ on our website for further Tips and Tricks.
Go to http://www.simplugins.com/html/faq.html

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Changing the instrument size

You have to start the panel first. Then left-click on each instrument and use the scroll wheel on the mouse or the [+]/[-] keys on the numeric keypad.

Configuring instruments

Many instruments have a configuration option to adjust them to various parameters. This allows each instrument to be customized to a specific aircraft type.

Many engine instruments require that a specific instrument is added multiple times to a panel in order to display data for multi-engine aircraft. Again, each of those instruments needs to be configured to specify what engine the instrument is used for.

Start the panel, the right-click with your mouse on the instrument and select 'Setting' from the pop-up menu. Adjust any setting required and click on the save button.

Each adjustment you make to an instrument is specific to this instrument and the panel it is contained in.

Using instrument buttons and dials

Many instruments contain buttons and dials (knobs). All those elements are fully functional and can be used with a mouse, as in previous versions. As of Version 2.6 of Panel Builder those elements have been improved for use with a touch enabled monitor. A multi-touch monitor is not required, a simple single touch monitor is sufficient.

Element	Mouse	Touch-Screen
Button	Left-Click on button	Touch button on screen
Single Knob (Dial)	Left-Click on knob and hold Move mouse clock or anti clock wise in a circular motion.	Touch knob and move finger in a circular motion clock or anti clock wise.
Dual Knob (Radios)	*Outside dial* Left-Click just outside of knob and hold. Move mouse clockwise or anti clockwise in a circular motion. *Inside dial* Left-Click on inside of knob and hold. Move mouse clockwise or anti clockwise in a circular motion.	*Outside dial* Touch just outside of knob and move finger in a circular motion clockwise or anti clockwise. *Inside dial* Touch just inside of knob and move finger in a circular motion clockwise or anti clockwise.

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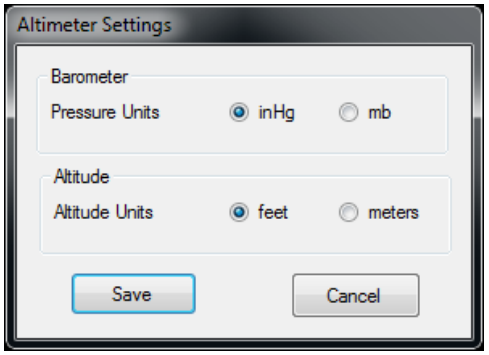
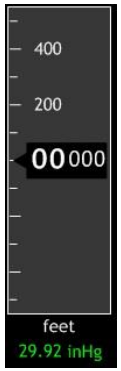
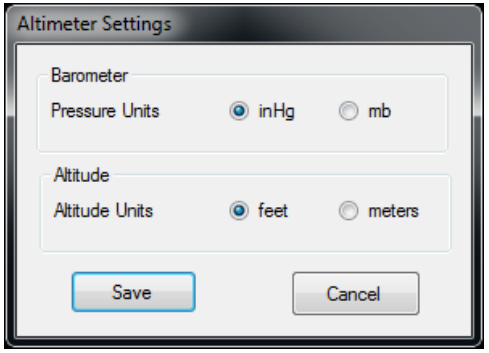
Instrument Reference - Primary

Instrument	Settings	Defaults
Altimeter (Analog) 		Port Number: 41004
Altimeter EFIS 		Port Number: 41004

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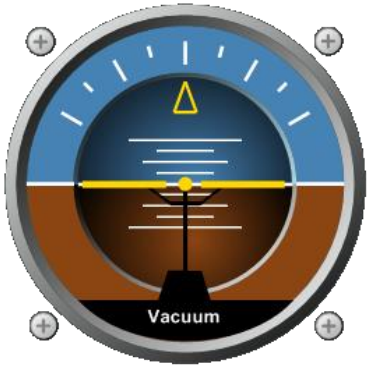
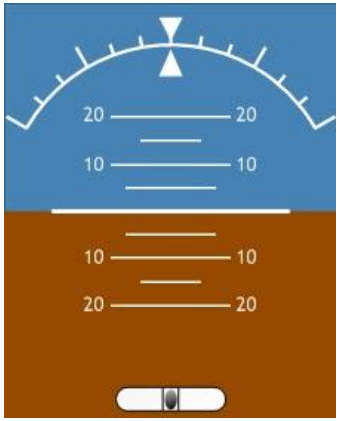
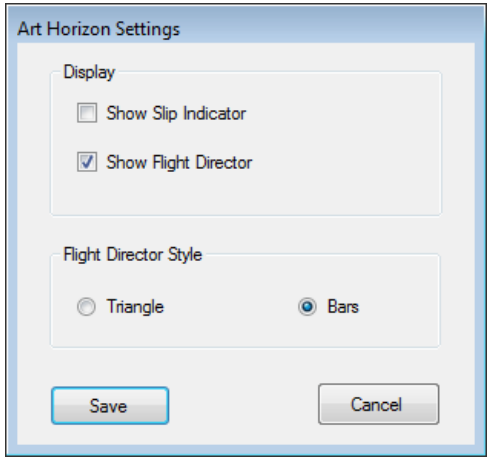
Instrument	Settings	Defaults
Artificial Horizon 	Analog Instrument used as a backup	Port Number: 41005
Artificial Horizon EFIS 	Also contains Slip Indicator 	Port Number: 41005

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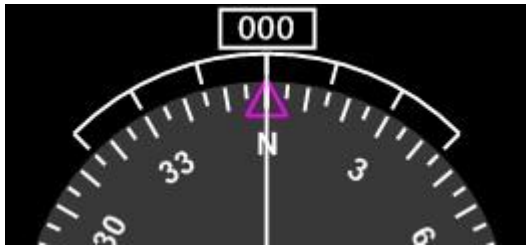
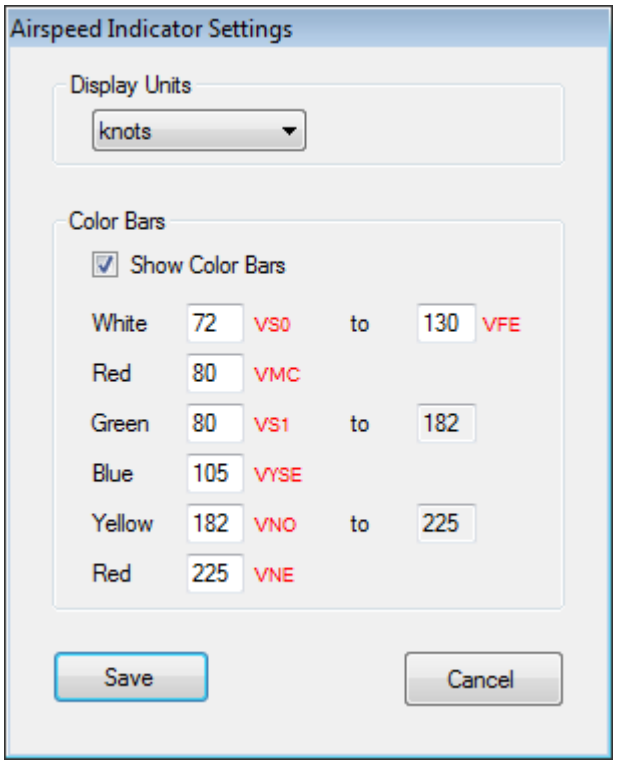
Instrument	Settings	Defaults
Heading Indicator EFIS 	Also displays the Turn Rate and Autopilot Heading Bug.	Port Number: 43003
Airspeed Indicator EFIS 		Port Number: 41001

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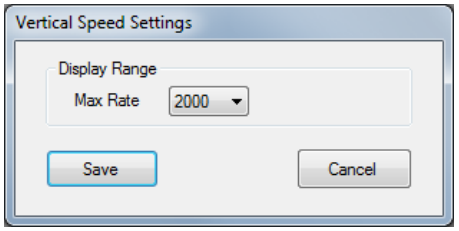
Instrument	Settings	Defaults
Vertical Speed Indicator EFIS 	 Also displays the Autopilot Vertical Speed Hold	Port Number: 41003
Radio Altimeter 		Port Number: 41007

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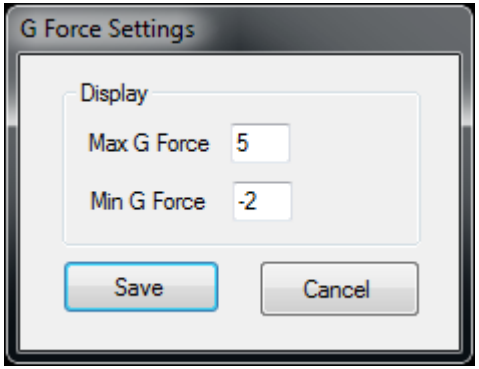
Instrument	Settings	Defaults
G Force Meter 		Port Number: 41009
Radar Altimeter Label EFIS 		Port Number: 41007
TAS (True Airspeed) Label EFIS 		Port Number: 41001
GS (Groundspeed) Label EFIS 		Port Number: 41001

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Instrument Reference - Navigation

Instrument	Settings	Defaults
HSI EFIS 	Dual Needle HSI NAV1 and ADF DME info for NAV1 Glideslope for ILS Autopilot Heading Bug Turn Rate Indicator above compass	Port Number: 43003
Autopilot Altitude Select 12500		Port Number: 43005
Autopilot Speed Select Label 0		Port Number: 43006

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Instrument	Settings	Defaults
Autopilot Heading Select Label 		Port Number: 43003
Glideslope Indicator EFIS 		Port Number: 43003
Localizer Indicator EFIS 		Port Number: 43003
VOR1 Label EFIS 		Port Number: 43007
VOR2 Label EFIS 		Port Number: 43007

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Instrument	Settings	Defaults
NDB Label EFIS 		Port Number: 43003

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Instrument	Settings	Defaults
Navigation Display EFIS – Moving Map	Simple Moving Map World Wide Database Always North Up Buttons turn features on/off Knob select Zoom Configuration Options via right click menu for: Font Sizes Marker Sizes Runway Sizes Font Color Marker Color Runway Color Show/Hide Heliports Show/Hide Seaport Map update Rate Tall or Square layout Update feature buttons from flightsim (X-Plane only)	Port Number: 41010

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Instrument	Settings	Defaults
Auto Pilot (advanced) 	Dial (Altitude): Position Mouse on Dial VS + / VS -: Vertical Speed Select Note: Depending on the aircraft type, not all autopilot features might be functional, especially the VS mode (UP/DN buttons) and the Altitude preselect (DIAL)	Port Number: 43005
Auto Pilot (Simple) 		Port Number: 43005
DME 	Dial : Select NAV 1 or 2	Port Number: 43007

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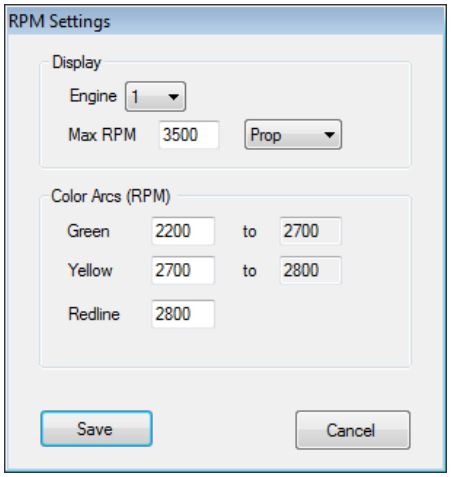
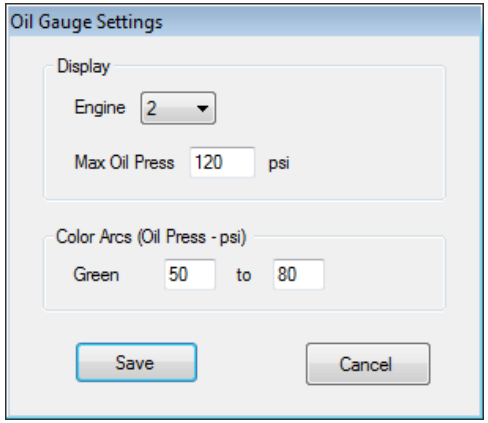
Instrument Reference – Engine

Instrument	Settings	Defaults
RPM EFIS (Engine 1 – 4) 		Port Number: 42001
Oil Pressure EFIS (Engine 1 to 4) 		Port Number: 42002

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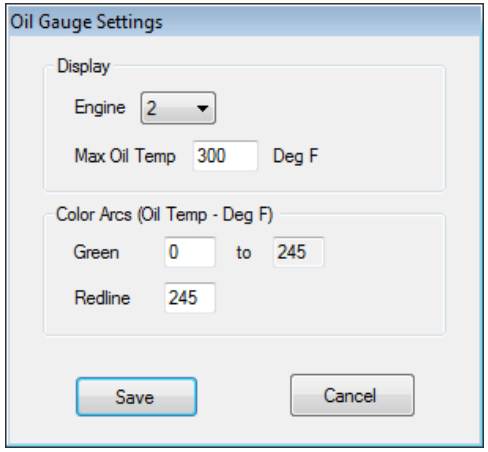
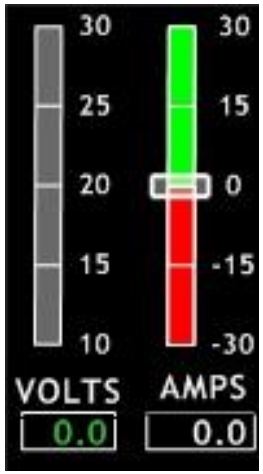
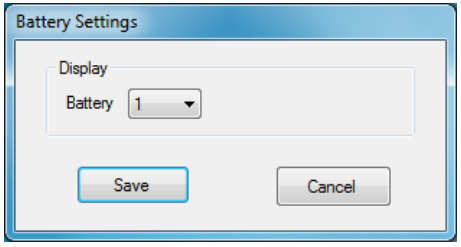
Instrument	Settings	Defaults
Oil Temp EFIS (Engine 1 to 4)		Port Number: 42002
Battery Volts and Amps EFIS 		Port Number: 42003

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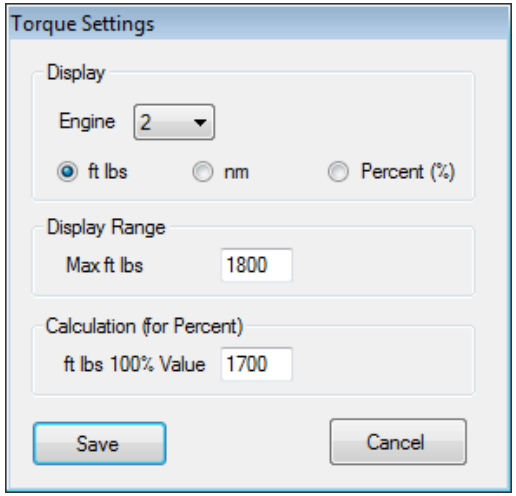
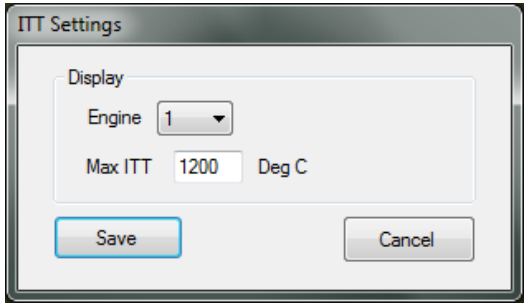
Instrument	Settings	Defaults
Torque (Engine 1 to 4) 		Port Number: 42009
ITT EFIS (Engine 1 to 4) Inter Turbine Temperature 		Port Number: 42006

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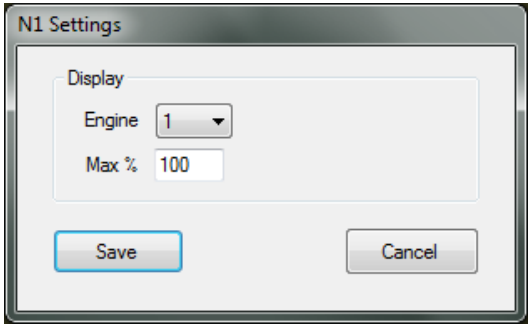
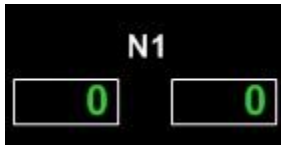
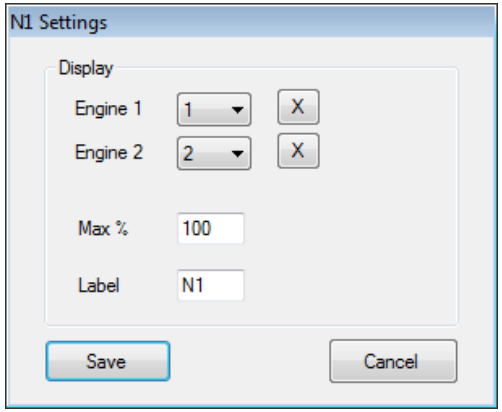
Instrument	Settings	Defaults
N1 EFIS (Engine 1 to 4) RPM of Low Pressure Turbine Shaft 		Port Number: 42007
N1 Label EFIS (Engine 1 to 4) RPM of Low Pressure Turbine Shaft 		Port Number: 42007

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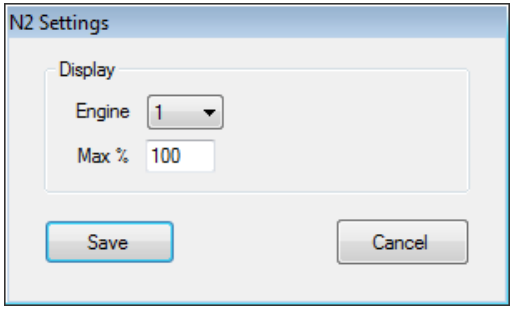
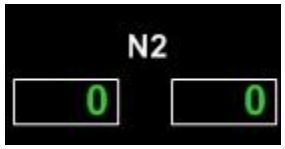
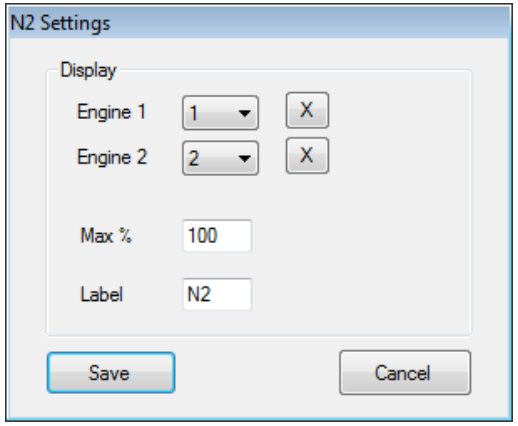
N2 EFIS (Engine 1 to 4)
RPM of High Pressure Turbine Shaft



Port Number: 42007

N2 Label EFIS (Engine 1 to 4)
RPM of High Pressure Turbine Shaft





Port Number: 42007

Hobbs Meter
Engine Hours

Port Number: 44006

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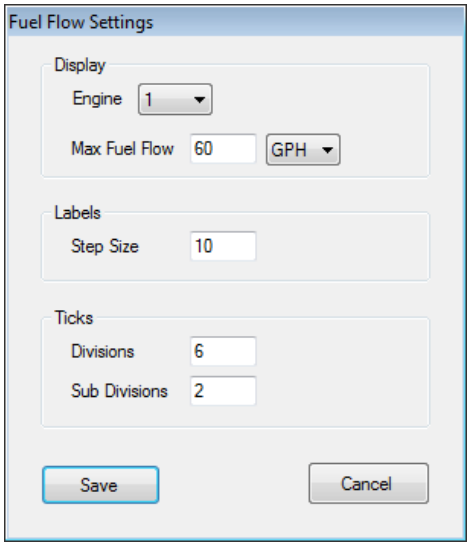
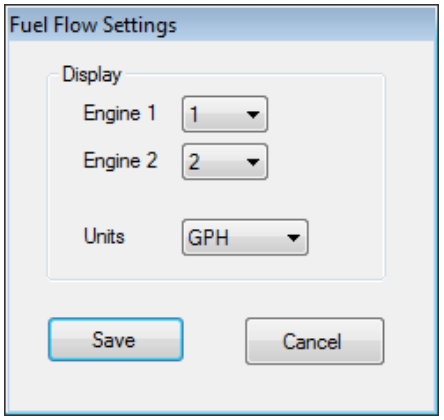
Instrument	Settings	Defaults
Fuel Flow EFIS (Engine 1 to 4)	 Fuel Flow Settings Display Engine 1 Max Fuel Flow 60 GPH Labels Step Size 10 Ticks Divisions 6 Sub Divisions 2 Save Cancel	Port Number: 42008
Fuel Flow Label EFIS (Engine 1 to 4)		Port Number: 42008

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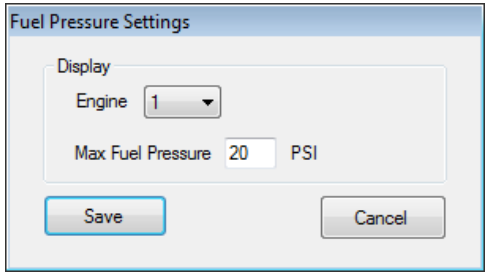
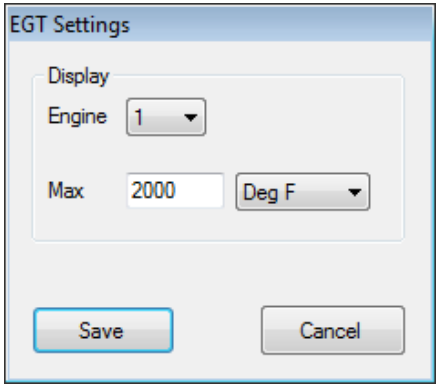
Instrument	Settings	Defaults
Fuel Pressure EFIS (Engine 1 to 4)		Port Number: 42015
Exhaust Gas Temp EFIS (Engine 1 to 4)		Port Number: 42005

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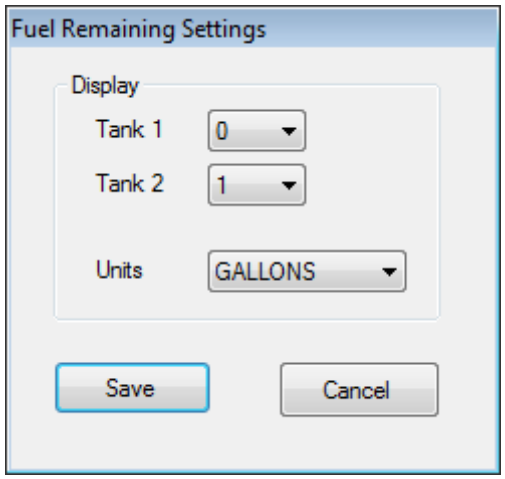
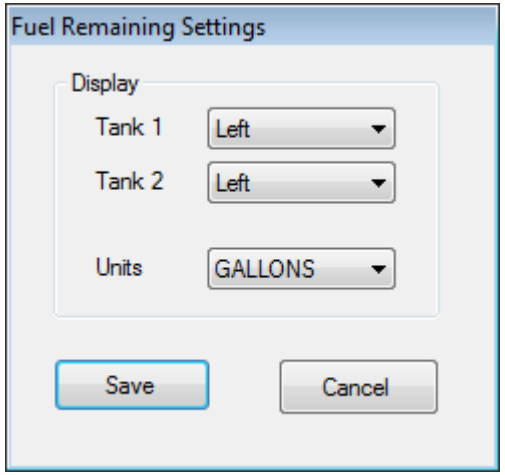
Instrument	Settings	Defaults
Tank Remaining Label EFIS (0 to 8) X-Plane 		Port Number: 42004
Fuel Remaining Label EFIS (9 Tanks) FSX & FS2004 		Port Number: 42004

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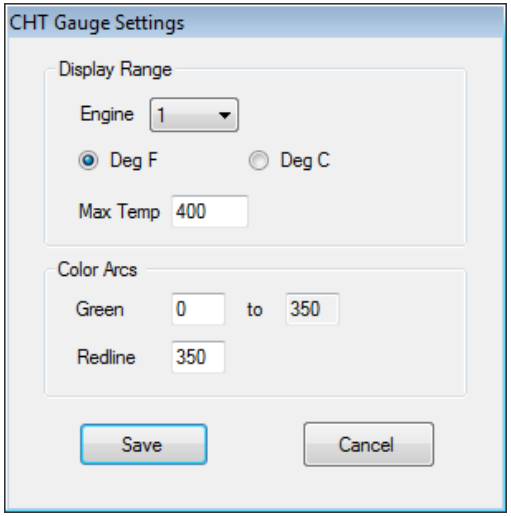
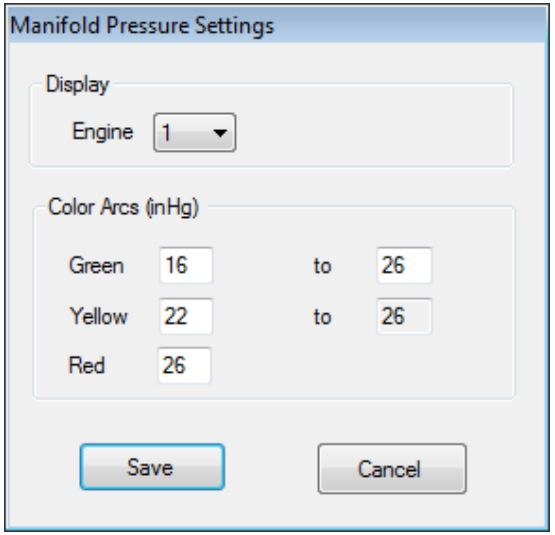
Instrument	Settings	Defaults
Cylinder Head Temp EFIS (Engine 1 to 4)		Port Number: 42010
Manifold Pressure EFIS (Engine 1 to 4)		Port Number: 42005

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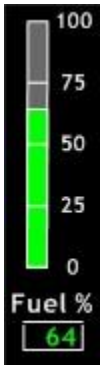
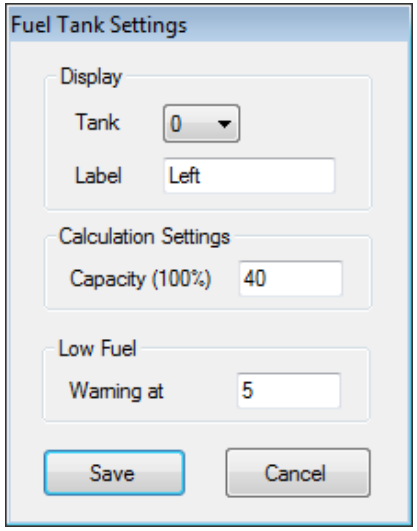
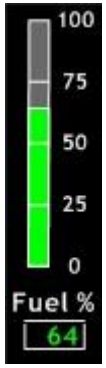
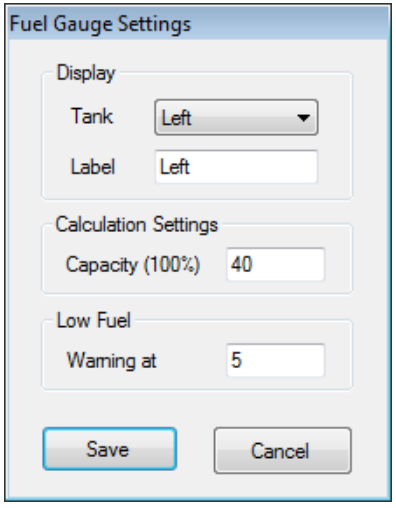
Instrument	Settings	Defaults
Fuel Tank EFIS (Tank 0 to 8) X-Plane 		Port Number: 42004
Fuel Tank EFIS (9 Tanks) FSX 		Port Number: 42004

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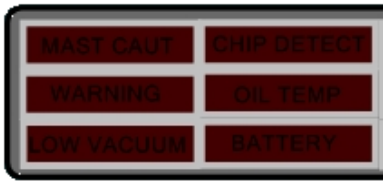
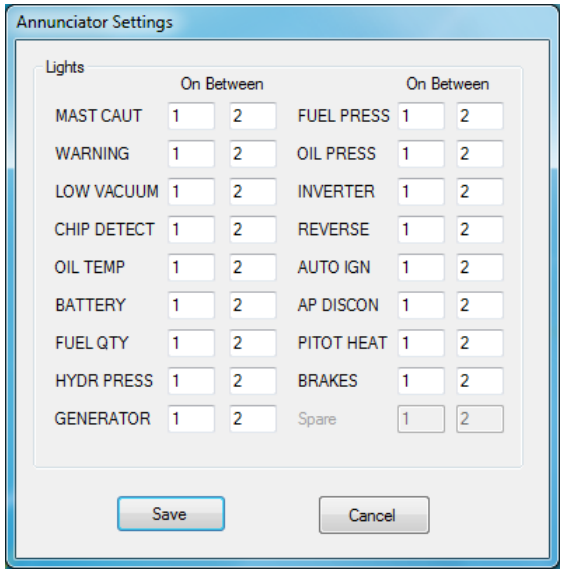
Instrument Reference – Annunciators

Instrument	Settings	Defaults
Annunciator Horizontal and Vertical Version  	 Enter Values when the light should come on. The first Value is inclusive, the second value is exclusive. Example: 1 2 means the light comes on for values that are 1 or greater, but smaller than 2	Port Number: 44001 X-Plane example shown. For Microsoft Flight Simulator you have to enter the value Range from the instrument when the light should be On. For Example Oil Temp: 250 to 999 to show an on light when the Oil Temperature reaches 250 Deg F. This configuration applies to all other Annunciators as well.

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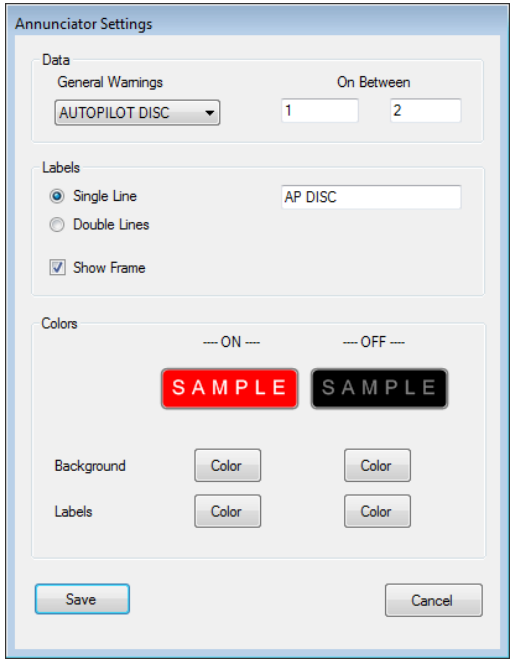
Instrument	Settings	Defaults
Annunciator Single General, Engine and Lights	 Enter Values when the light should come on. The first Value is inclusive, the second value is exclusive. Example: 1 2 means the light comes on for values that are 1 or greater, but smaller than 2	Port Number: 44001 There are 3 different Single Annunciator Lights. One for General Warnings, one for Engine Warnings and one for Light Status (shown left). Select a light from the dropdown and then change the Label Caption to match. Change colors by clicking on color boxes. The Engine version also requires you to select an Engine as the engine annunciators are per engine.

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Instrument	Settings	Defaults
Analog clock 		Port Number: 44005
OMI Display ILS Marker Lights 		Port Number: 44003
Suction Gauge 		Port Number: 44013

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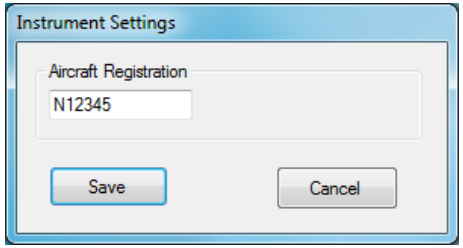
Instrument	Settings	Defaults
Stall Warning Light 		Port Number: 44009
Aircraft Registration Plaque 		Port Number: 44014
Chronometer 		Port Number: 44004 X-Plane only

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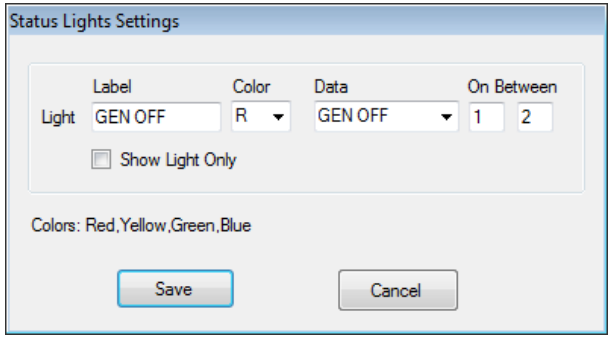
Instrument	Settings	Default
Status Lights (5 & 10 Lights) 	 To change datarefs/Variables see Section *Interface Modification*	Port Number 44014 (10 Light) Port Number 44015 (5 Light)
Status Light 1 		Port Number: 44001

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Instrument	Settings	Default
Fuel Selector Indicator		Port Number: 44019
Wind Direction & Speed EFIS		Port Number: 44022
Clock EFIS		Port Number: 44004

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Instrument	Settings	Default
Outside Temp EFIS 		Port Number: 44002
Flaps Indicator EFIS 		Port Number: 44012
Spoiler Indicator EFIS 		Port Number: 44016
Gear Indicator EFIS 		Port Number: 44011

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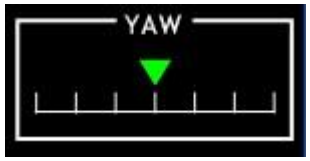
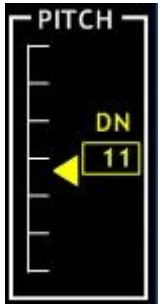
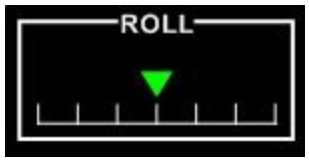
Instrument	Settings	Default
Trim Indicator Yaw EFIS 		Port Number: 44010
Trim Indicator Pitch EFIS 		Port Number: 44010
Trim Indicator Roll EFIS 		Port Number: 44010

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Instrument	Settings	Default
Autopilot Annunciator Heavy EFIS 		Port Number: 43006
Autopilot Annunciator EFIS 		Port Number: 43006

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Instrument Reference - Miscellaneous

Instrument	Settings	Defaults
EFIS Frame - PFD 	Place EFIS Style Instruments onto frame **Dials for** Heading Bug Course Bug **Buttons for** Barometer Up & Down	Port Number: 43003

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Instrument	Settings	Defaults
EFIS Frame - MFD	Place EFIS Style Instruments onto frame	Port Number: 48000

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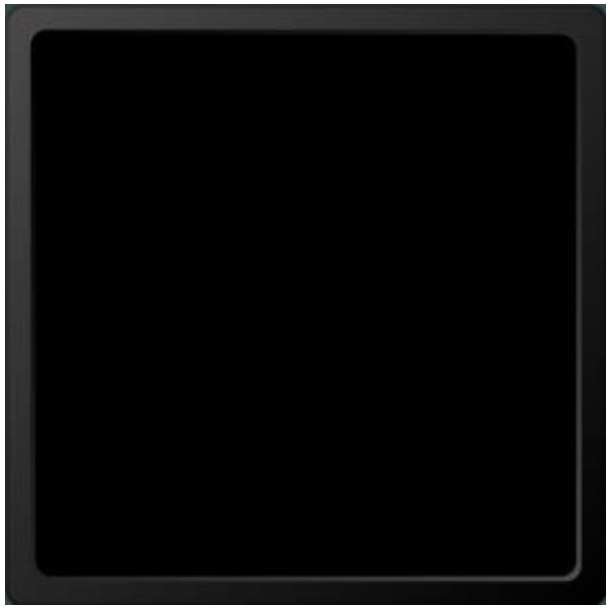
Instrument	Settings	Defaults
EFIS Frame MISC Square	Place EFIS Style Instruments onto frame	Port Number: 48000
		
EFIS Separator Line	Displays a horizontal or vertical line	Port Number: n/a

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Instrument Reference – Communications

Instrument	Settings	Defaults
COM 1 Radio 	Outer Dial: Frequency kHz Inner Dial: Decimal kHz Button: swap Active and Standby Frequency	Port Number: 47000
COM 2 Radio 	Outer Dial: Frequency kHz Inner Dial: Decimal kHz Button: swap Active and Standby Frequency	Port Number: 47000
NAV 1/2 Radio 	Outer Dials: Frequency kHz Inner Dials: Decimal kHz	Port Number: 47000

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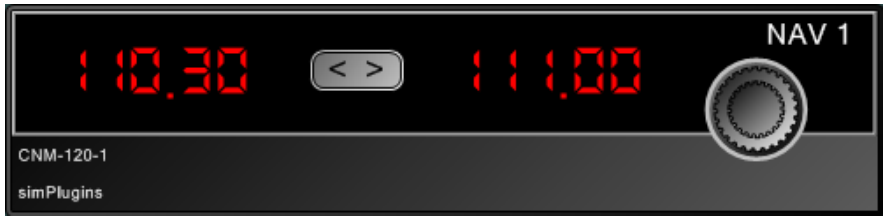
Instrument	Settings	Defaults
NAV 1 Radio 	Outer Dials: Frequency kHz Inner Dials: Decimal kHz	Port Number: 47000
NAV 2 Radio 	Outer Dials: Frequency kHz Inner Dials: Decimal kHz	Port Number: 47000
ADF Radio 	Dials: Frequency kHz Note: The DME might not work for all flight simulators or different NDBs	Port Number: 47000

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Instrument	Settings	Defaults
Transponder 	IDT: Send Ident VFR: Set to squawk to 1200 Number Buttons: Set squawk code	Port Number: 47000
Audio Panel 	Buttons: Set Audio output for Radios Note: only partially supported with FSUIPC	Port Number 47000

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Instrument	Settings	Defaults
Radio EFIS		Port Number 47000

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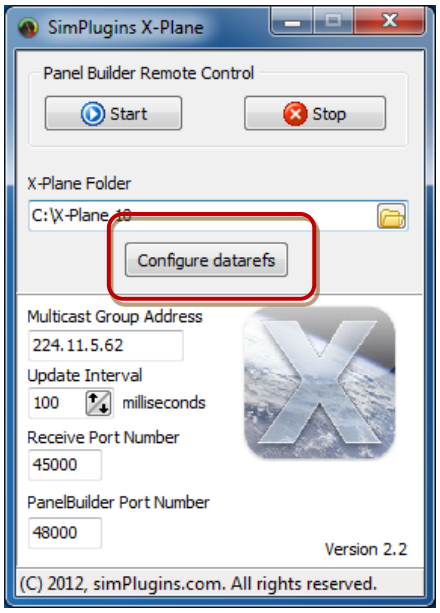
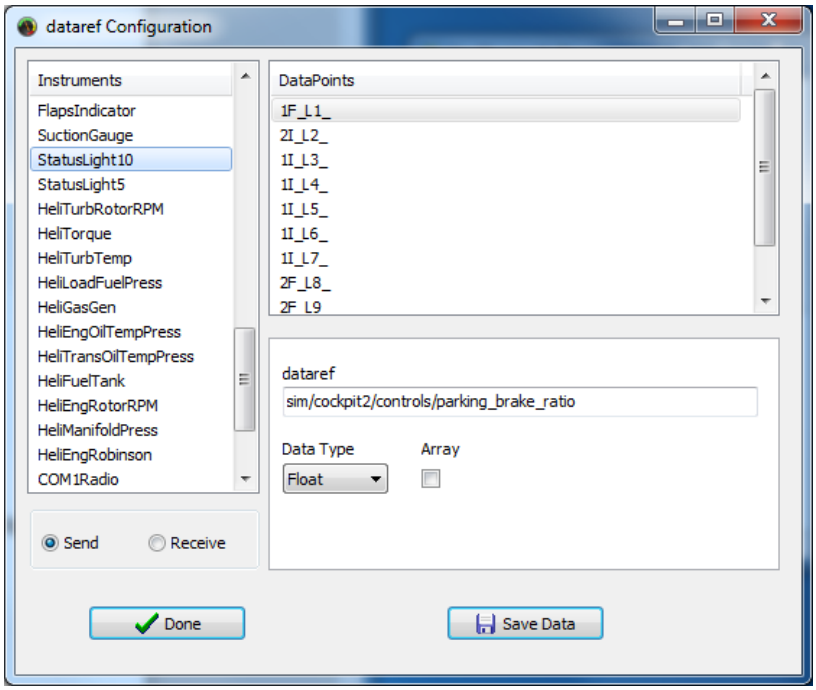
Interface Modification

X-Plane 9

You can configure each dataref that drives the instruments using the SimPlugins X-Plane program. Make sure an X-Plane folder is selected and then click on [Configure datarefs]





This facility gives you the freedom to change datarefs once they become obsolete or are superseded by a new dataref without requiring a program update.

Select the Instrument to change on the left side. In the DataPoints section it will show an ID for each dataref that is configured. Many instruments have more than one.

In the lower section, enter the dataref information.

Data Type can be *Integer, Float or String*.

Array indicates typically an engine dataref where data for multiple engines is provided. You can specify how many you want by entering *No of Members*, for example 2 for a twin engine aircraft.

Don't forget to click [Save Data] after each change made.

A complete reference of datarefs can be found under the X-plane plugins folder in a file called `datarefs.txt`.

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X-Plane 10 (10.20 or greater)

You can configure each dataref that drives the instruments using the SimPlugins X-Plane program.

This facility gives you the freedom to change datarefs once they become obsolete or are superseded by a new dataref without requiring a program update.

The plugins for x-plane where installed in the previous step under

```
C:\X-Plane 10\resources\plugins
```

There are 3 configuration files for the plugin.

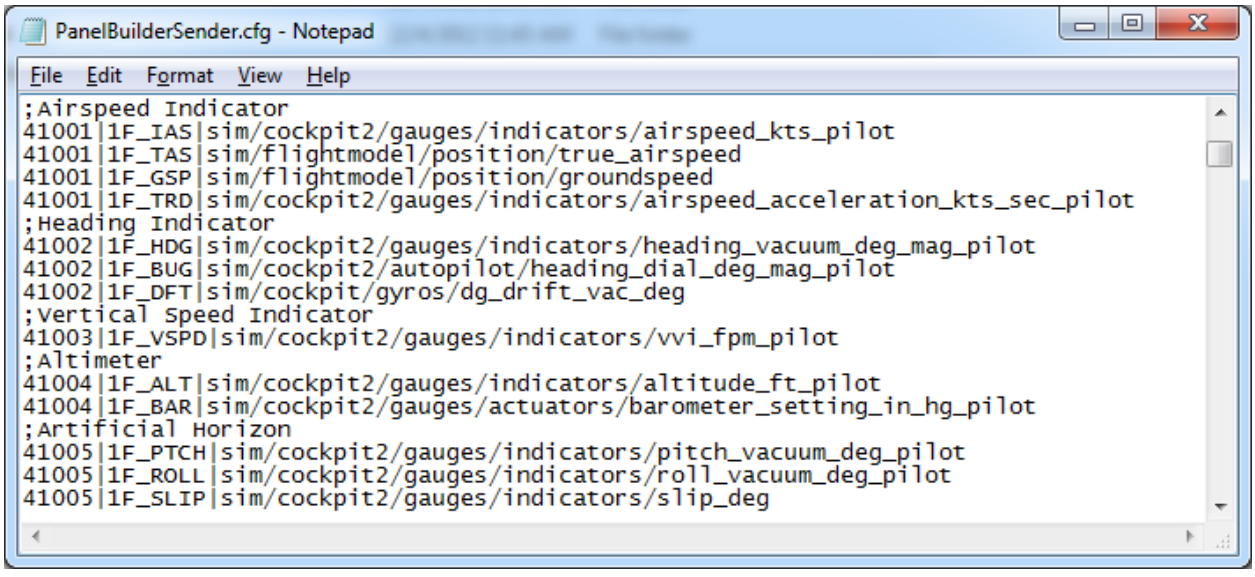
In folder `C:\X-Plane 10\resources\plugins\PluginPanelBuilder1`

PaneBuilderSender.cfg *X-Plane sends dataref values*

In folder `C:\X-Plane 10\resources\plugins\PluginPanelBuilder2`

PanelBuilderReceiverDAT.cfg *X-Plane receives values for datarefs*
PanelBuilderReceiverCMD.cfg *X-Plane receives values for commands*

Use notepad or any other text edition to modify the datarefs in the above listed configuration files. **Make a backup copy first!** Also note that those files will be overwritten by a software upgrade. Always keep a copy of the original and your modified files.



A complete reference of datarefs and commands can be found under the X-plane plugins folder in a file called `DataRefs.txt` and `Commands.txt`.

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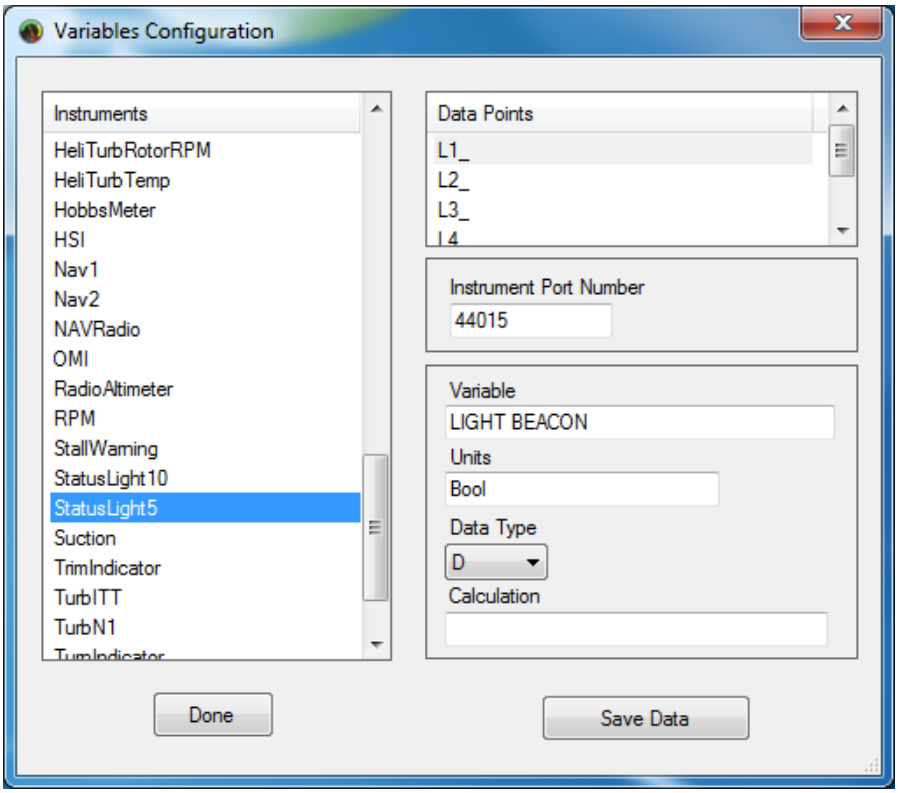
Microsoft Flight Simulator X or Lockheed Martin Prepar3D

You can configure each variable that drives the instruments using the SimPlugins FSX or P3D program. Click on [SimConnect Configuration]



This facility gives the freedom to change variables to suit our requirements

Select the Instrument to change on the left side. In the DataPoints section it will show an ID for each variable that is configured. Many instruments have more than one.

In the lower section, enter the variable information.

Variable are any of the published SimConnect simulator variables. For a complete list see

http://msdn.microsoft.com/en-us/library/cc526981.aspx

Units specifies the unit of measure (see the reference listed above)

Data Type can be either *D,I or S (Decimal, Integer or String)*

Calculation is required for some instruments to make them work with Panel Builder.

Calculation Format: {0} specifies the value being sent from SimConnect

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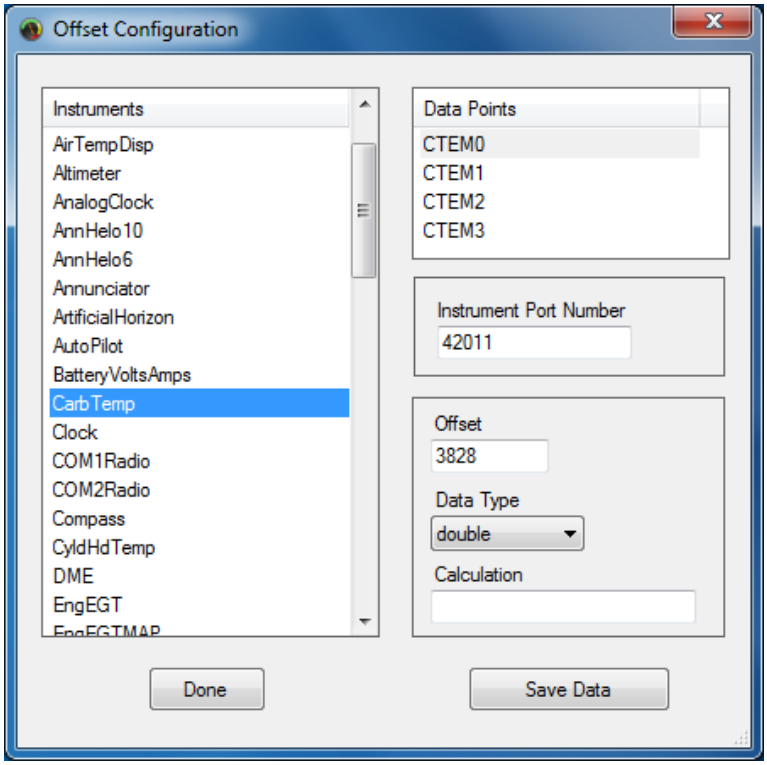
Microsoft Flight Simulator or Lockheed Martin P3D FSUIPC

You can configure each variable that drives the instruments using the simPlugins FSUIPC or simPlugins FSUIPC P3D program. Click on [Offset Configuration]



This facility gives the freedom to change variables to suit our requirements

Select the Instrument to change on the left side. In the DataPoints section it will show an ID for each variable that is configured. Many instruments have more than one.

In the lower section, enter the variable information.

Offset is any of the published offsets. For a complete list see the FSUIPC documentation.

Data Type is the correct datatype as depending on offset. The table below will help with making the correct selection.

Calculation is required for some instruments to make them work with Panel Builder.

Calculation Format: {0} specifies the value being sent from the Simulator

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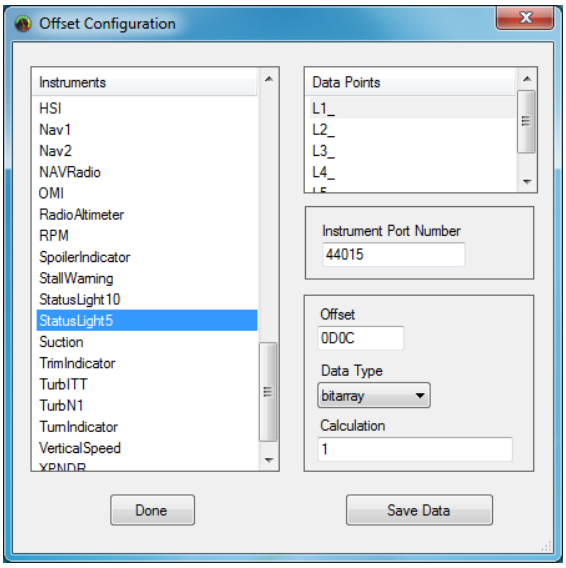
Datatypes for Offsets

Offset Size	datatype
1	byte
2	short (signed) ushort (un-signed)
4	int (signed) uint (un-signed)
4 (Specified as 32 bit Float)	float
8	long (signed) ulong (unsigned)
8 (Specified as FLOAT64)	double
Any specified string	string

The offset 'bitarray' is used the following way:



In addition to the Offset, you have to specify which bit within the array will provide the wanted value.

In the example above we are using the bitarray for the aircraft lights. This array provides status information which lights are on or off (Landing, Beacon, Strobe etc.). Each status is stored in a bit of the array. In the Calculation Filed you have to specify which bit to use for this data point. In the example above we use bit no '1', which indicates if the Navigation Lights or on or off.

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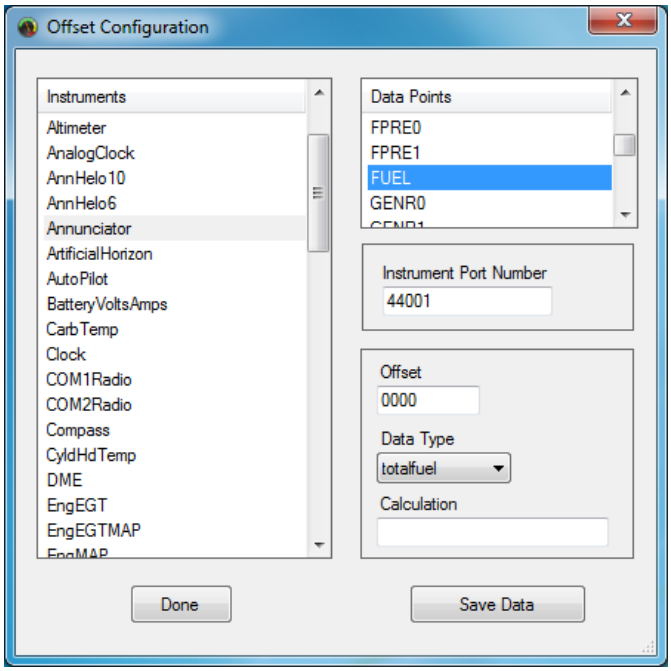
There are is an additional ‘offset’ used by Panel Builder called ‘totalfuel’. This is not a real offset. It I used to provide a value for the total fuel available in gallons. There is no offset available prior to Flight Simulator X to give this value.

The offset can be set to ‘0000’ as this is not really an offset.



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simPlugins EFIS Panel Builder
User Manual Version 2.9

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